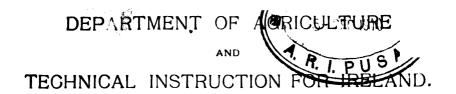


AGRICULTURAL RESEARCH INSTITUTE
PUSA



## JOURNAL.

VOLUME VI.

[OCTOBER, 1905, TO JULY, 1906.]



DUBLIN:
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## INDEX TO VOL. VI.

### (OCTOBER, 1905, TO JULY, 1906.)

								rage
Agricultural Co-operation	in Ge	rman	у.	Ву Н.	de F.	Moi	1t-	16
gomery, Produce, Impe	·	· c	•	•				
· •		τ,	•	•	201,	400,	550,	
Settlements,	•	•	•	•	•	•	•	142
Agriculture (Irish) in 1904,	•	•	•	•	•	•		34
Animals, Diseases of,		•	•	•		397,		
Exports and Import		•	•	•	186,	384,	582,	
Arterial Drainage in Ireland,	•	•	•	•	•	•	•	340
Bacon, Irish,					•			656
Barley Experiments, .						•		403
"Beef" versus "Stores,"		•		,				261
Boards, Meeting of the,					135,	336,	554,	748
Butter Competitions, The Sur	prise,				160,	348,	712,	756
Price Statistics, .	•			•			578,	774
Price Statistics (Crean	nery),						199,	38 <b>3</b>
Buttermaking, Home, .	- ,							641
Butter Trade, Report on the,								709
Canadian Cattle Embargo,							341,	561
Canal Commission,								557
Cattle, "Redwater" in .								248
Cement Industry in France,								346
- Making in Belgium,							•	146
Commercial Education (Highe	r).	Bv M	. E.	Sadler				233
Congested Districts, Royal Con	•	-						758
Council of Agriculture, Meetir							209,	601
Co-operation (Agricultural) in	~		·.	By H.	. de	F.	•	
Montgomery, .								16
Crop Reports, July, 1906,								676
Crops and Herds (Irish), in 19	05,						,	140
-								136
Dairy Conference, The,	•	· Wast	·	. (Δ)		•	•	460
Disease of Young Cattle in Co		44 GY1	.ora	(A.),	204	397,	• 577	
——— of Animals, Statistics			•	•	<i>2</i> ∪4,	551,	<i>011</i> ,	340
Drainage in Ireland, Arterial,	•		•		•	•		JŧV

### [ ii ]

Early Potato Growing. By M. G. Wallace	·,		•		3
Education, The Place of Science in,		•	•	•	647
Emigration Statistics,	•	205,	400,	595,	791
Exports and Imports of Animals,		186,	384,	582,	778
Fertilisers and Feeding Stuffs Act in Engli	and,				154
Field Experiments in 1905,				•	403
Fisheries Investigations in the North Sea,		•	•	•	143
Fishery, Irish Spring Mackerel,				•	155
Summer Herring,					158
——————————————————————————————————————	•	164,	370,	564,	760
Fishes, Food of some Edible,					45
Fishing Industry of Germany,			•		73
Flax Growing on the Continent,					50
Food in Time of War,					345
— of Edible Fishes,					45
Forestry, Advisory Committee on, .					755
Felling and Selling Timber,					451
Management of Plantations,					290
National Importance of, .					24
					270
Proper Method of Planting Tree	s,				274
					286
Training at Oxford,					142
Trees for Poles and Timber,					278
Shelter and Ornament	, .				282
Fruit Crop Reports, July, 1906,			•		686
Fruit suitable for Cultivation in Ireland, .			•	•	62
Germany, Agricultural Co-operation in,					16
Sea Fishing Industry of, .					73
Glanders, Experiments on Horses infected wir	th,				39
Glass Trade, The Belgian,					148
Gooseberry Mildew,		•	•		445
Hand-spinning Industries on the Continent,	•				55
Hedges, The Planting and Management of,					455
Home Buttermaking,	•	•	•	•	641
Importation of Canadian Cattle .		•		341,	561
Imports and Exports of Animals,		186,	384,	582,	778

Imports of Agricultural	Prod	uce,			•	201,	400,	596	, 792
of Live Stock ar									700
Irish Bacon,									656
Produce in British	Mark	ets,			•				338
—— Marketing of, .	•	•	•	•	•	•	•		662
Lectures on Sanitary	Scienc	e,							<b>33</b> 9
Live Stock and Dead M									700
Local Science and Art E		-			•	**		•	351
Mangels, Experiments	in G	rowi	ng,						426
Marketing of Irish Produ	ıce,								662
Meadow Hay Experimen	ıts,								416
Meetings of the Boards,	•					135,	336,	554,	748
of the Council	of Agr	ricul	ture	. •					, 601
Method in Educational I									477
Migratory Labourers,									559
Munster-Connacht Exhib					•				757
Nitro-culture Experie	ments	,			•	•	•		339
North Sea Fisheries Inve	stigat	ions,	,	•	•	•	•	•	143
Oats: Experiments in g	rowin	g,					•		432
Official Documents: Adr	ninist	rativ	e-						
Appointment of	Men	bers	of (	Counc	il and	Board	ls,		310
Members of Co	uncil	of A	gric	ılture	, <b>&amp;</b> c.,		•		718
Official Documents: Agri	cultu	re—							
Agricultural Sc									104
Albert Agricult									724
Experiments Sc									316
Improvement in									<b>50</b> 0
Improvement in									498
Instruction in F						•			324
Live Stock Scho									82
Munster Institu	te Pr	ospe	ctus,	•	•		•		<b>72</b> 6
Notes on Cream	ery M	[ana	geme	ent,	•		•		729
Poultry Fatteni	ng St	tatio	n,	•	•	•	•	323,	728
Prizes for Cotta	_				-	•	•		314
Register of Crea				ıxilia	ries,				518
Scholarships in .	Agric	ul <b>tu</b> r	e,	• .	•		•	•	496
School of Rural	Econ	omy,	1			•		325,	727

0.00 1.170 ( .00 1.1.1.2							rage
Official Documents: Technical Inst			•			100	7/1
Commercial and Industria			-	•	•	100,	741 327
Domestic Economy Teacher	-			ıg,	•	•	736
Lace Industry,	•		•	•	•	•	123
		•		•	•	,	330
Local Scholarship Examin Local Science and Art Exa				•	•	•	128
				•	•	•	
Manual Training (Woodw			•	•	•	332,	
Science and Technological			-	•	•	•	325 525
Summer Courses for Teach Official Documents; Veterinary—	iers,	•	•	•	•		020
•						•	994
List of Sheep Dipping Pre	-			•	•	•	334
Sheep Dipping (with plans	'),	•	•	•	•	•	531
Potato Experiments,	•	•	•	•	•	•	419
growing, Early, .	•	•	•		•	•	3
Prices of Agricultural Products,	•	•	•	184,	380,	574,	770
Butter,	•	•	•	•	•	•	578
——— Creamery Butter, .	•	•	•	•	•	199,	383
Railways (Irish) Viceregal Com				•		•	757
"Redwater" in Cattle. By A. E.							<b>248</b>
or "Blood Murrain" i	n Cat	tle,	•				448
Salmon and Freshwater Fisheries	of E	nglano	d and	Wal	es.		346
Sanitary Science, Lectures in, .		_					339
Scholarships, Commercial and Indus							139
Domestic Economy,	. ′						138
Technological,							138
Science in Education, The Place of,							647
Sea Fishing Industry of Germany,							73
Settlements, Agricultural, .							142
Sheep Dipping, (with plans), .			•				531
Mortality in Ireland, .							627
Parasites,							295
"Stores" versus "Beef,"							261
Summer Courses for Teachers .		•					<b>7</b> 56
Surprise Butter Competitions, .		•		160,	340,	712,	<b>756</b>
Tea and Coffee Consumption,				_			150
Teachers, Summer Courses for,		•					756
Tuberculosis in Cattle, Prevention	of,						658
Turnips, Experiments in Growing,			-				436
Veterinary Congress at Buda-Pe	st,						305
Vice-President's Addresses to Coun-		eeting	zs.			216.	

### DEPARTMENT OF AGRICULTURE

AND

TECHNICAL INSTRUCTION FOR IRELAND.

## JOURNAL.

Early Potato Growing—Agricultural Co-operation in Germany—The National Importance of Forestry—The Position of Irish Agriculture—Glanders and the Mallein Test—The Food of Edible Fishes—Flax Growing on the Continent—Hand Spinning Industries on the Continent—Varieties of Fruit—The German Sea Fishing Industry—Official Documents—Notes and Memoranda—Statistical Tables.

SIXTH YEAR.

No. 1.

OCTOBER, 1905.



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### CONTENTS.

					Page
Early Potato Growing. By M. G. Wallace,	•	•	•	•	3
Agricultural Co-operation in Germany.	$\mathbf{B}\mathbf{y}$	H.	de	F.	
Montgomery,	•	•	•	•	16
The National Importance of Forestry, .	•	•	•		24
The Position of Irish Agriculture, in 1904,	•		•		34
Glanders and the Mallein Test. By Prof. A.	E. Me	ttam	, .	•	39
The Food of some Edible Fishes,		•			45
Flax-growing Methods in some Continental D	istrict	s,			50
The Flax and Hemp Hand-spinning Industries i	n som	e Cor	itine	ntal	
Countries,					55
Varieties of Fruit suitable for Cultivation in I	reland	l,			62
The German Sea Fishing Industry,			•		73
OFFICIAL DOCUMENTS:-					
Agriculture,		٠		•	82
Technical Instruction,	•	•	•	•	123
Notes and Memoranda:-					
Meetings of the Boards, &c. (p. 135). Iris					
Dairy Show (p. 139). Irish Crops and I	Herds	in ]	905	(p.	140)
Agricultural Settlements (p. 142). Training	ng in	Forc	stry	at O	xford
(p. 142). North Sea Fisheries Investiga	tions	(p. :	143).	E	states
Commissioners' Report (p. 144). Cement Mo	ıking i	n Be	lgiun	n (p.	146).
The Belgian Glass Trade (p. 148). Tea	and (	Coffee	Co	<b>กร</b> นฑ	ption
(p. 150). Diseases of Animals in Ireland (p.	. 151)	. I	he I1	ish (	Cattle
Trade (p. 153). The Mackerel and Herring	Fishe	ries,	1908	б (р.	155).
Surprise Butter Competitions, 1905 (p. 160).				,,,	•
STATISTICAL TABLES,		•		٠	163
e-mailte-satisfaces					

#### NOTICE.

Communications respecting the literary contents of this JOURNAL should be addressed to the Superintendent of the Statistics and Intelligence Branch, Department of Agriculturs and Technical Instruction for Ireland, Upper Merrion-street, Dublin.

Communications respecting Advertisements should be addressed to ALEX. THOM & Co. (LIMITED), MIDDLE ABBEY-STREET, DUBLIN; or to LAUGHTON & Co. (LIMITED), I ESSEX-STREET, STRAND, LONDON, W.C., and not to the DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRBLAND.

### EARLY POTATO GROWING.

The progress of early potato growing in Ireland continues.

There has been no great or rapid extension,

The growth of the Industry.

but wherever the Department have tried experiments, the people who conducted them under the guidance of the Depart-

ment have themselves continued to grow early potatoes, and their neighbours have followed their example. Already the industry has assumed such proportions as to affect the English and Scotch markets, and this year the fields of growing crops were visited by large numbers of merchants from England and Scotland. Happily, the crops were good enough and early enough to satisfy these merchants as to the possibilities of the industry in Ireland, and accordingly, on their return home they handled with alacrity the consignments of new potatoes sent to them from the growers they visited. Consequently, the Irish early potato crop has now come to be reckoned as a serious factor in the supply of new season potatoes for the British markets. Though no extravagant prices have been received, the season 1905 has been a satisfactory one. The crops have generally been good and very early. They did not suffer from adverse weather, and on the whole prices were remunerative.

County Cork, as in former years, leads in point of earliness. At

Clonakilty, raising commenced as early as the

Experiments in
Co. Cork.

Clonakilty, more especially in the hands of

farmers who had had three or four years' experience in growing. Some crops were sold growing, and realised as much as £35 per acre for the growing crop, the purchaser taking

as much as £35 per acre for the growing crop, the purchaser taking all further risks. Other crops were consigned to commission merchants in England and Scotland, and after paying all expenses, realised a sum per acre equal to that obtained for those that were sold growing. The particulars of one crop—a fairly representative one—may suffice to illustrate. This was the fine crop of Mr. T. J. Canty. The extent under potatoes was 1 acre 3 roods, which produced in the first week of June, 8 tons 10 cwt. These were sold in Glasgow at prices ranging from £10 to £12 per ton, subject to a deduction of £2 for costs, and the net amount received for the whole crop was £71 2s. 6d. The price per acre for the crop as grown was, therefore, over £40. The ground in this case, as well as in

all the others, is covered with excellent crops of turnips, cabbages, and other green food. At Youghal, the Department had not hitherto carried out any experiments, but as there had been some private ventures with varying success, it was resolved to try what could be done with early potatoes in that district, already so famous in the early history of potato growing. Inspection of the locality disclosed the fact that there was a very large extent of most suitable land some miles west of the town. This land is chiefly in the hands of small occupiers. The fields are small and sheltered by high turf walls, and the soil is a warm sandy loam. The conditions being thus apparently very favourable, the Department resolved to carry out several experiments there. following are the results: Mr. Michael Gleeson, Pilmore, grew 2 roods and 1 pole, which produced 2 tons 9 cwt. 2 qrs. during the second week of June, and realised the net sum of £18 15s. 6d. variety was "Ninetyfold," and all were marketed in Glasgow. Mr. John Griffen, Pilmore, grew 2 roods, which produced 2 tons 5 cwt. in the second week of June ,and realised a net sum of £16 8s. 5d. The variety was the "May Queen," and all were marketed in Glasgow. Mr. James Griffen, Pilmore, grew 2 roods, which produced 2 tons 13 cwt. in the third week of June, and realised the net sum of £16 19s. 5d. The variety was "Epicure," and the produce was marketed partly in Manchester and partly in Glasgow. The crops at Youghal were very good, and seemed to be more vigorous than those at Clonakilty, but they were decidedly later, and apparently have not been quite so remunerative. For a first effort, however, the results are extremely good, and there is no doubt whatever that with experience they can be improved upon. At the Munster Institute one acre each of "Ninetyfold," "May Queen," and "Epicure" was planted. This crop suffered from a severe frost in April, which the other places already mentioned in County Cork seemed to have entirely escaped. The crop was, therefore, thrown back to some extent, but it did not appear to suffer any other material damage. The "Ninetyfolds" were ready for raising on the third week of June, and 1 acre produced 8 tons of marketable potatoes, which were sold in Manchester at £7 per ton. The net return was close upon £45 per acre. "May Queens" were ready about the same time, but they were a lighter crop. They produced 6 tons per acre, the net return being £35 per acre. "Epicures" were later, and were not ready for market until the first week in July, when prices had sunk so low that an extremely fine crop did not produce £30 per acre. This seems to confirm the experience of former years, that "Ninety-fold" is the best general purpose potato for early work in the South of Ireland. "Epicure" is more popular in the North of Ireland, and for the moment is in most demand amongst Ayrshire growers. It seems to be hardier, and resists adverse weather better than "Ninetyfold," which has a softer leaf; but where conditions are extremely favourable, as they are along the seaboard of County Cork, it would appear that the somewhat delicate potato, "Ninetyfold," gives the best results in point of earliness.

At Kilmore, in County Wexford, two experiments were tried.

The variety in this instance was "Puritan,"

and Irish-grown seed was used. The results in both cases were somewhat disappointing.

In one case, where the extent grown was

1 rood and 20 poles statute, the total produce on the second week of June was 220 stones, equal to 3 tons 13 cwt. 2 qrs. per statute acre. As the potatoes were marketed locally the money value does not furnish any guide as to what would have been obtained for them had they been shipped to England. The after crop in this case is not very flourishing, and on the whole the experiment cannot be regarded as a success. In the other Kilmore case 1 rood was planted, for which a money value of £12 Gs. 4d. was received—a good return; but as the produce was sold locally it is no evidence of what can be realised by shipping to English markets. The subsequent crop of turnips in this case is extremely good.

In County Sligo Sir Josslyn Gore-Booth, of Lissadel, was again an extensive grower. As in former years, Experiments at

Lissadel, Co. Sligo. Gore-Booth, has furnished the Department with a complete report as follows:—

"We continued the early potato-growing experiments this year, and laid down about 16 statute acres. We tried the bulk of them in a different soil to previous years, viz., a light sandy soil, as against a rich loam heretofore. Although, speaking generally, this sandy soil is ideal land for growing early potatoes, it, unfortunately, did not suit the weather we had in 1905. The potatoes here not only suffered by far the worst in the three frosts we had, but, in the drought which followed, the potatoes were scorched in the hot sand. They were cut down by frost three times—on April 7th

and 23rd, and May 2nd. Whilst the frosts of April 7th and May 2nd burned the leaves, that of April 23rd burned both stalks and leaves. That frost, we believe, put us back about two weeks, and consequently we were largely out of the running for the earliest markets. This year we could only start digging (in small patches) on June 13th, as against June 7th in 1904 and June 9th in 1903, and that in spite of the fact that we had expected, this year, to be able to start to dig about June 1st, owing to the very suitable soil.

"Farm Department.—These were the potatoes planted in the sandy soil referred to. The following table shows details of the potatoes dug up to July 22nd, when they were planted, and the respective earliness (with us) of each variety:—

Variety.	Area. (Statute.)	Date Planted,	Date Lifted.	Yield.	Average Yield per Statute Acre.
Kate Henderson,  Ninetyfold,  Duke of York,  May Queen,  Kate Henderson,  Ninetyfold and Duke of York.  Ninetyfold,  Duke of York  Ninetyfold,  May Queen,  May Queen,  Epicure,	0 2 0 0 1 22	Feb. 6, 9, 9, 9, March 3, 7, 7, 7,	June 13,	T. C. Q. 0 7 1 0 12 3 0 7 2 0 6 0 4 18 1 6 9 0 3 12 0 2 17 0	T. C. Q. 3 1 0 4 12 3 4 16 0 2 18 1 4 4 1 7 2 2 7 4 0 7 3 3
	4 2 1	_	-	27 11 0	621

<sup>&</sup>quot;It is only right to say here that the first patch referred to, and the small plot of 'May Queen' dug June 16th were grown under the shade of trees.

<sup>&</sup>quot;The first variety we had ripe to dig in quantity was 'Kate Henderson' on June 17th. Although being the earliest potato with us (as it always has been) it suffered the most from the frost. The next earliest was 'Ninetyfold' on June 24th; and here, as in every previous experiment, we have not only almost the earliest

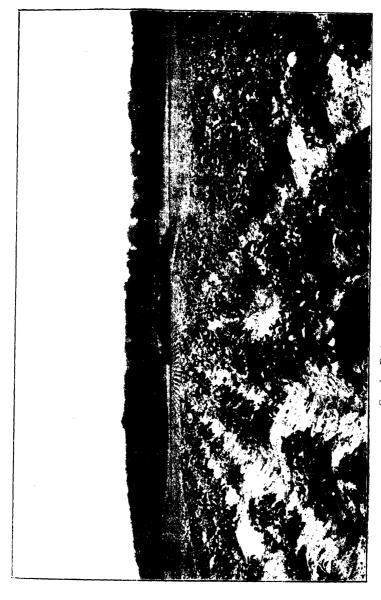


Fig. I.—Early potatoes planted unsprouted.

Fig. II. Early potatess, sprouted in boxes before planting.

That I were take ? 2 and I was 1905

but also the most prolific potato we have grown. 'Duke of York' comes next, and runs 'Ninetyfold' fairly close for earliness, beats it in quality, but does not compare with it for yield.

"Farmyard manure was used, at the time of planting the seed, at the rate of 24 tons to the acre, as against 30 tons in 1904, whilst the artificial manure used in addition per statute acre was as follows:—

- 4 cwt. 35 per cent. superphosphates.
- 31, 24 per cent. sulphate of ammonia.
  - 3, 80 per cent. sulphate of potash.

"Garden Department —Here we tried more detailed and more careful experiments than before, in a rich loam soil which had previously been used for early potatoes. The potatoes were not to any extent affected by the frost. In the following table the varieties are given in the order of digging:—

Variety.	Area. (Statute.)	Date Planted.	Date Lifted.	Yield.	Average Yield per Statute Aere.
Ninetyfold,  Duke of York,  Sir J. Llewellyn,  Duke of York (Artifleial Manure only).  Duke of York (Farmyard Manure only).  Kate Henderson,  Sir J. Llewellyn,  Duke of York,  Boyal Kidney,	R. P. YD.  0 26 0 0 16 16 0 15 12 0 14 0 0 8 0 0 4 18 0 3 0 0 26 10 0 15 2 0 2 24	March 3. , 4, , 3, , 28, April 3, March 4, Jan. 31, April 6, March 10, April 6,	,, 23 to 28, ,, 28 to:29, ,, 20, — ,, 30, — { ,, 30, to } } July 8.j July 10 to 18,	T. C. Q. 0 17 2 0 10 2 0 9 3 0 8 0 0 4 2 0 2 2 0 4 1 0 29 1 0 15 0 0 2 31	T. C. Q. 5 7 2 5 1 2 5 1 0 4 8 0 4 10 0 4 17 2 11 16 0 8 17 0 7 19 0 10 11 1
	3 11 0		-	5 4 01	6 7 0

"'Ninetyfold' is first here, for earliness as well as yield, with 'Duke of York' second. The small patch of our favourite, 'Kate Henderson,' here takes a back seat, whilst the great yield of the 3 perches of Sir John Llewellyn, planted January 31st and dug June 30th, strikes one at once.

"Forest Department -In the nursery here (clay soil) we had 'Ninetyfold' and 'Duke of York.' The area planted was

0a. 1r. 8p., and it was dug from June 30th to July 8th. The yield from this was 2 tons 3 cwt. 2 qrs., which shows an average of 7 tons 5 cwt. per statute acre. 'Duke of York' did best here, and it has been the best in this soil also in 1904 and 1903.

"The total results of the portion of our early potatoes dug and sold up to July 22nd show as follows:—

			Area. (Statute.)	Yield.	Gross Receipts.	Expenses referred to.	Net Receipts,
Farm,	•••		 A. R. P. 4 2 1	т. с. о. 27 11 0	£ s. d.	£ s. d.	£ s, d.
Garden, Forest,		•••	 0 3 11 0 1 8	5 4 0¦ 2 3 2	44 16 4 12 12 2	5 5 8	39 10 8 11 11 11
			5 2 20	34 18 21	230 11 5	44 5 U	186 6 5

"The total dug, 34 tons 18 cwt. 2 qrs. realised, therefore, gross, £230 11s. 5d. This shows an average per ton of £6 12s., as against £8 4s. for 1904, and £10 for 1903. The gross amount of the return per statute acre was £53 in 1903, £38 in 1904, and this year £41.

This year, owing to our only being ready a few days before Ayrshire, we only got a few consignments into the Glasgow market before we were shut out, and consequently we turned on to Liverpool and Manchester at once. As the direct steamer only sails once a week we were here handicapped with much heavier freights per ton by rail and boat  $ri\hat{a}$  Dublin, Greenore, or Belfast, than to Glasgow, either direct or  $vi\hat{a}$  Derry, and we were doubly hit, because, although the prices received per ton this year were lower, we were making up on our increased yield. Whilst we daily did our best to get our consignments over the 2 tons to secure the lowest through rate, even these rates were a big handicap.

"Our expenses for marketing the crop, carriage—outward and on returned empties—porterage, commission, advertising, telegrams, &c., were £44 5s. The net return per statute acre was, therefore, £33, as compared with £33 in 1904, and £45 in 1903, and from these figures the cost of labour, manures, seed, carting, and other expenses, must be deducted.

"The result of our experiments for the past three years is—that the potatoes must be ready early for the market, and the earlier the better. We should have our potatoes marketed, if possible, before Ayrshire starts.

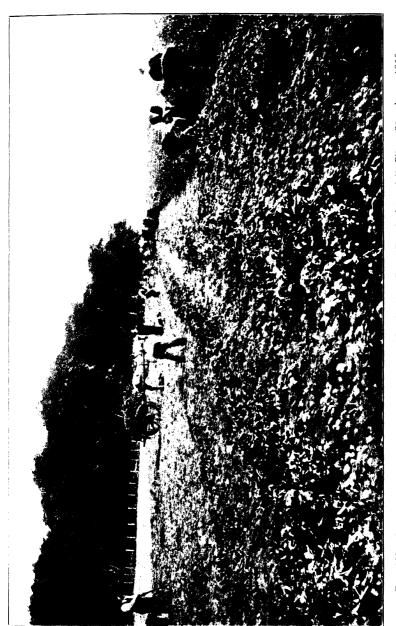


Fig. III. - Digging early potatoes on the farm of Sir Tosslyn Gare Booth, Lissadell, Sigo, 21st June, 1905. The ground on the left had already Leen element and sown with turnips.



Fig. IV.—Early potatoes, grown at Lissadell, on the way to Sligo for shipment, 8 o'clock, a.m., 21st June, 1905.

"So far, 'Ninetyfold' is the best potato for earliness combined with yield, though 'Kate Henderson' has for four years in succession beaten it for earliness alone.

"This spring we bought as much of a new variety, 'Milecross Early'—a beautifully-shaped oval potato—as the raisers would sell us, viz., one ton. We only received it in March and planted in on April 8th, and in digging for seed the ton has realised 14 tons 16 cwt. 1 qr. Although planted so late, and not properly sprouted, the crop of this potato was fit for digging before the end of June, and I expected this variety (with us at any rate) to beat all the others.

J. A. Cooper,

Agent for Sir Josslyn Gore-Booth, Bart."

When I visited this crop at the end of May it had the appearance of being extremely vigorous, and likely to prove a very bountiful one. Examination showed the results of the repeated frosts which Mr. Cooper refers to. The stalks had branched and were very umbrageous, producing large numbers of tubers to each root, but not early. Still there was not much to complain of in a crop of over  $4\frac{1}{2}$  tons on the 13th June, and 7 tons 4 cwt. per acre on the 30th June. All this tends to demonstrate the extraordinary recuperative powers of the soil and climate. There are few places where a potato crop would survive the scourge of three successive frosts.

Mr. James Young, Ballincar, Sligo, reports thus:-"I had five or six perches over half an Irish acre, and, indeed, they were a great success. They Other Experiments in Co. Sligo. came to £33 10s. Though the price was not half as good as last year for the last lot sent, the extra crop made up for the deficiency in price. 'Ninetyfold' was the first to come in. I was greatly surprised and pleased with them, as I thought that when the frost nipped them we would have no crop. I intend to set an acre next year, and I am very thankful to the Department for introducing me to such profitable and successful farming." Mr. Samuel Hunter, Ballincar, Sligo, reports thus: -- "I beg to say I had a most wonderful return from 6 cwt. of seed (planted in 1 rood 13 poles). I realised £13 17s. 6d. in cash, and the field is covered with a very good crop of turnips. 'Ninetyfold' did best, and I mean to plant a field of them next year."

Mr. James Kerr, Winnsforth, Sligo, writes:—"I sincerely thank the Department for the experiment of 'Ninetyfolds.' They have been a very good crop, and I might have dug them up much sooner than I did and have got a better price for them. I had 31 perches of ground set with them, and the produce was sent to Glasgow, and made 8s. per cwt., the net cash received being £10 5s. They were a splendid crop, and there is a fairly good turnip crop in their place. They have paid well."

Mr. W. J. M'Mullen, Tallyho Lodge, Sligo, reports:—"I planted 1 rood 20 perches with 6 cwt. of 'Ninetyfolds' and 4½ cwt. of 'Epicure,' which were supplied by the Department. I dug the 'Ninetyfold,' or most of them, on 14th June, and got £10 10s. per ton in Glasgow, after which the price fell quickly. But the yield was good, and the plot made £15 net. The 'Ninetyfold' are the earliest by a week and are good croppers. The 'Epicure' is a very good table potato, and locally was in more favour than the 'Ninetyfold.'"

In County Clare the Department conducted experiments at Mur-

Experiments in Co. Clare.

roughs, where the crops had been so successful the two previous seasons. This year they were equally good; but the difficulties of transit and marketing, alluded to last year,

still obtain, and there seems little use in the meantime in endeavouring to extend the area in this district beyond the requirements of local markets. The same may be said of two experiments which were conducted at Lahinch.

The results of the Murroughs experiments are as follows:—Michael M'Cormick grew 1 rood, which produced 1 ton 5 cwts., for which £9 5s. was received; Thomas Howard grew 1 rood, which produced 1 ton 4 cwt. 3 qrs., and realised £8 10s.; Michael Howley grew 1 rood, which produced 1 ton 3 cwt. 1 qr., for which £8 15s. was received. The land is all replanted with turnips.

At Rush, in County Dublin, the system of sprouting in boxes
has now become almost universal, the

Experiments in growers having been thoroughly convinced
Co. Dublin. of its advantages. The acreage under potatoes in that district is scarcely capable of extension, as every available rood of land seems to be in the occupation of extremely skilful market gardeners. As indicating the

difference of the climate between the south of Ireland and the east coast, it may be remarked that in Rush the potatoes suffered not only from the frosts in April, which were also experienced at Sligo, but in some degree were severely struck by frost in the end of May which blackened many of the fields lying back from the seaboard, and the long spell of dry weather which succeeded did not give the crop a chance to recover. There is a general complaint in Rush that the season was short and prices unremunerative. At the same time some excellent yields are recorded, particularly of "Ninetyfold," which produced at the rate of 2 cwt. to the perch.

I wish again to record my belief that the application of a good early potato manure (such as is recommended in the Department's leastlet No. 19), is what is required in many of the crops at Rush. The difference in the appearance of the crop where such a manure had been used was very marked.

County Down appears to have made very rapid development in

Experiments in Co. Down.

the industry of early potato growing. Its northern situation and eastern exposure do not naturally suggest that the same success could be possible as in the south of Ireland.

Still, the evidence of the past two years seems to contradict this, and certainly there were crops in County Down which were not appreciably later than those of County Cork, and which, owing to their contiguity to markets, gave a much better return. The Department have not thought it necessary to conduct any special experiments in this county, as that was already being done most efficiently by the County Committee of Agriculture and Technical Instruction, under the direction of Mr. W. J. Megaw, the Agricultural Instructor for the county. The following report from Mr. Megaw speaks for itself:—

"For the third successive season experiments have been carried out in the Kilkeel district to test its suitability for early potatogrowing. The experience now gained from these trials should give the farmers residing on the stretch of sea-coast from Annalong to Rostrevor a fair idea as to the possibilities of profitably growing early potatoes on an extensive scale.

"In the seasons of 1903 and 1904 the results of the experiments were most satisfactory both as regards yield and earliness of crop, and also from the financial point of view. The results obtained

this year have again been highly satisfactory, as will be seen from the following table, which gives the returns of this year's experiments:—

Name of Grower.	Yield per Statute Acre.	Average Price per Ton.	Gross Return per Statute Acre.	Railway : market- ing per	Jharges and Ex- penses per Statute Aore.	Net Return per Statute Aere,	Time of Lifting Crop.
Thos. Stevenson, Maghereagh, Ed. Hutchinson, Maghereagh, Issae Hamilton, Oranfield, Andrew Orr, Cramfield, John Crangle, Lisnaeree.	T. C. 6 18 8 13 6 0 8 0 7 17	£ s. d. 6 0 0 6 12 6 6 17 8 7 1 0 7 7 6	£ s. d. 41 7 0 57 16 0 41 6 0 56 8 0 58 0 0	1 8 4	13 10 0 8 15 0 10 18 0 cally	£ s, d. 31 12 0 44 6 0 32 11 0 45 10 0	28th June. 15th to 27th June.

<sup>&</sup>quot;The plots occupied about 1 rood each.

"The first four of above growers' potatoes were sold by Messrs. M'Loughlin Bros., 57, Mary-street, Belfast. They were all consigned to Belfast on the hope that remunerative prices could be obtained in that market. The prices there were, however, extremely fluctuating and unsatisfactory: good prices at this season could only be obtained on an occasional day for very small lots. In consequence, nearly all the potatoes had to be sent across to various towns in Lancashire. Had they been shipped direct from Kilkeel viâ Greenore and Holyhead a saving could have been effected in the transit and marketing expenses, and an increased net return thereby obtained. The expenses of marketing would also be relatively much less if a larger quantity of potatoes were being handled. The returns, therefore, rather under-estimate what might be obtained if, instead of small experimental lots, large areas of early potatoes were grown in the district and shipped direct to the English market.

"The variety principally grown was 'Puritan.' Mr. Orr had also a small quantity of 'Ninetyfolds' and 'May Queens,' both of which varieties turned out satisfactory. 'Ninetyfold' was the most productive of the three varieties.

"The system of manuring was to apply a liberal dressing of farmyard manure at the time of planting, and supplement this with about 6 cwts. per statute acre of the artificial manure mixture recommended by Mr. M. G. Wallace. (See Department's leaflet, No. 19.)

"The potatoes were planted in the latter end of February and the first week of March. With the exception of Mr. Crangle's, the potatoes in all the other lots were well through about the 25th of April, and were badly damaged by a severe night's frost at this time. They recovered very quickly and suffered no further checks.

"W. J. MEGAW.

" 23rd Aug., 1905."

I visited these plots with Mr. Megaw on the 13th June, and was highly pleased with their vigour and earliness. They appeared to me to be not appreciably later than Clonakilty, and had they been raised in the first week of June would probably have produced a yield similar to the best in County Cork. They were, however, not lifted until the third week in June, when the crop had doubled. The facilities for marketing are excellent in County Down, there being a daily service from various ports at extremely moderate rates, and this to a large extent accounts for the handsome net return. If the experience of a series of years will prove that County Down can be as immune from spring frosts as it has been for the past three seasons, there is no reason why the acreage may not be very greatly increased. Certainly, the staple of soil necessary is present, and, apparently, also the men to handle it. the neighbourhood of Comber there were many large fields of early potatoes, showing that these had already become a recognised feature of the farming of the district. The extensive plain of fine red sandy loam between Comber and Newtownards is all eminently suitable for early potato growing, and assuredly the evidences of high farming in that district indicate that the occupiers of holdings have little need of counsel from anyone in the management of their business.

On the shore of Belfast Lough a considerable quantity of early potatoes is grown within easy distance of Belfast, the largest area being in the hands of Mr. A. M. Kirker, Craigavad House, who is probably the largest individual grower of early potatoes in Ircland. Mr. Kirker's entire crop was sold growing to the Belfast firm of M'Loughlin & Co. at a high figure, which has not been revealed, but which is immaterial for the purpose of this report.

What it is important to know is the fact that "May Queen" commenced to raise on the 14th June, and at that date produced 7½ tons per acre. I happened to visit Craigavad on the same day, and was amazed to see such a heavy yield at that early date. In this instance the variety of "May Queen" seems to have done best, because at that date they could not fail to be netting at least £10 per ton. It is only fair, however, to state that "May Queen" occupied the earliest and softest land on the farm. "Ninetyfold" were also an excellent crop, and were raised during the last week of June and first week of July, and yielded 12 tons per acre.

the variety of "Ninetyfold" has given the Points for Growers. best results. This confirms the experience of previous years, and probably Irish growers will do well to hold by this variety until some other kind has given evidence of superior merit. Those who contemplate extending their areas should procure small quantities of the various popular sorts in order to test for themselves what suits their district best. Early potatoes are capricious in this respect, and the properties of a so-called early variety can only be truly tested in an early district. Many of the lauded varieties at present advertised as "first early" are not really so when subjected to this proof, however good they may be on soils and in climates that do not admit of growing for the first early markets.

It is wise, also, to study the fashion of the markets to which growers consign their produce. Glasgow has no objection to a round potato, and if "Epicure" is found to be as early and as productive as "Ninetyfold," there is no reason why it should not be adopted if Glasgow is to be the market. It has some advantages over "Ninetyfold," having a hardier stalk and leaf, and can consequently better resist the hurtful influences of frost, winds, &c. English markets, on the other hand, undoubtedly prefer a kidney or long-shaped potato, and "Ninetyfold" will be accepted in many markets where "Epicure" cannot find a place. "May Queen," on account of its splendid quality, will always displace either, but, apparently, the yield is not so good in most cases as "Ninetyfold."

There is a marked improvement in the general tillage of the crop over 1904. At the same time it cannot be said that the best possible has yet been done in this respect. In few cases was the soil so loose and soft as one would desire to see it. As this is a

purely mechanical operation altogether independent of weather conditions, there is not much excuse for neglect, and growers should endeavour to improve upon the present state of matters. Careful and thorough tillage affects the result of the crop far more than they may think.

Marketing has been much better done this year, growers no doubt profiting from the mistakes of previous years. The visits of the Scotch and English merchants had also a good effect, as they furnished much useful information. Thus, it may be expected that in another year growers will be prepared to meet any marketing emergency.

M. G. WALLACE.

# AGRICULTURAL CO-OPERATION IN GERMANY. 1904-5.\*

The most important event in connection with agricultural co-

Amalgamation of the Raiffeisen and the Reichs-Verband Organisation. operation in Germany in the course of the past twelve months is the success of the negotiations for a union between the Raiffeisen organisation, which has hitherto had its headquarters at Neuwied, and the Reichsverband organization, with its headquarters

at Darmstadt. These two organizations have hitherto worked independently, side by side, all over the German Empire, with considerable waste of power by overlapping and in various forms, often very undesirable, of rivalry. In some cases this rivalry may have had a stimulating effect, but on the whole it was a serious cause of weakness to the movement, and the leaders on both sides seem to regard the arrangement now arrived at with satisfaction. the present many of the provincial unions, with their affiliated societies, continue to work side by side, under the terms of a friendly understanding, but the supreme control of both organisations being now united, local amalgamations will follow. present, Dr. Haas, of Darmstadt, Privy Councillor and member of the Reichsrath, with two coadjutors, Herr Johannssen, of Hanover, representing the Reichs-Verband, and Herr Caspers, representing the Raiffeisen organisation, presides over a combination of thirty-nine unions, representing collectively 16,139 agricultural co-operative societies.

Associated with Dr. Haas, as Chairman, and his coadjutors, as Deputy Chairmen, is an executive committee of seven and a general committee of fifty, consisting of the chairmen of the provincial unions, central banks and other institutions in connection with the enlarged *Reichs-Verbund*. The terms of the union have been so arranged as to secure the continued existence within it of the special institutions of the Raiffeisen organization and the maintenance intact of the strict rules by which societies connected with that organization are bound.

At the annual general meeting of the *Reichs-Verband* at Strasburg on the 16th—19th of August—the first general meeting at which the *Raiffeisen* societies took part as members—Dr. Haas presented his comprehensive annual report, containing a mass of

<sup>\*</sup>For other articles by Mr. Montgomery on the subject see Journal Vol. V., No. 1, p. 34 and Journal Vol. IV. No. 2 p. 214 and also Bulletin No. 2 Miscellaneous Series 1902,

interesting statistics of the whole movement, as well as of that portion of it directly or indirectly connected with the Reichs-Verband

Following the same principle of selection as was adopted in the General Statistics.

Journal for October, 1904 (Vol. V., No. 1, p. 34), the following figures bring the chief heads of Dr. Haas' statistics up to date:—

Total number of Co-operative So-		Corresponding Figures July 1st, 1904.
cieties registered in Germany up to July 1st, 1905,	23,700	22,400
Total number of Agricultural Co-		
operative Societies registered in Germany up to July 1st, 1905, Consisting of:—	19,323	18,309
Central Societies,	97	
Savings and Loan Societies,	13,137	
Agricultural Supply Societies,	1,831	
Dairy Societies	2,822	
Miscellaneous Societies,	1,436	
Total membership in round num-	1 700 000	
bers,	1,700,000	
Which—making the necessary de- duction for those who are members		
of more than one society—is		
estimated as representing,	1,200,000 persons.	
φ,		
Callegation down among of the Control		Corresponding Figures
Collective turnover of the Central Credit Institutions connected with		for <b>1903</b> .
the Reichs-Verband in 1904 (ex-		
cluding Neuwied)	Marks, 2,190,645,529	Marks, 1,782,225,299
,,	(£109,532,276)	
Collective turnover of Central Credit		, , , ,
Institutions outside the Reichs-		
Verband (including Neuwied),	Marks, 867,879,917	Marks, 782,200,929
Total,	(£43,393,995)	(£39,110,046)
Total,	(£152,926,272	Marks, 2,564,426,228 (£128,221,311)
Amount advanced to Co-operative	(2102,020,212	(2120,221,011)
Societies by the Central Credit		
Institutions of the Reichs-Verband		
in 1904,	Marks, 356,051,934	Marks, 301,000,000
Amount renaid and demonited with	(£17,802,596)	(£15,050,000)
Amount repaid and deposited with the same Central Institutions by		
the Societies,	Marks, 354,820,801	Marks, 311,000,000
	(£17,741,040)	(£15,550,000)
Collective paid up Capital of the	(31.,, 12, 52.5)	(111,010,000)
Central Credit Institutions con-		
nected with the Reichs-Verband		
in 1904, including paid up shares		
and profits placed to reserve (excluding Neuwied),	Marks, 10,615,928	Marks, 9,443,862
cruding reduried,	(£530,791)	(£472,193)
Collective paid up Capital of the	(=,,,,,,,,,	(
Central Credit Institutions out-		
side the Reichs-Verband (includ-		
ing Neuwied), in 1904,	Marks, 10,133,459	Marks, 10,237,087
	(£506,672)	(£511,854)
Total,	Marks, 120,749,387	Marks, 19,680,949
	(£1,0 <b>3</b> 7,469)	<b>(£9</b> 84,047)

В

The diminution of the paid-up capital of the institutions outside the Reichs-Verband is due to the writing off of a portion of the reserves of the central credit and supply institution at Neuwied under the circumstances mentioned below.

Corresponding Figures for 1903.

Amount of the collective Guarantee (Haftsumme) of the Societies to the Central Credit Institutions connected with the Reichs-Verbund (over and above the paid up shares), ...

Marks, 157,220,000 Marks, 141,168,000 (£7,861,000) (£7,058,400)

This guarantee forms the cover for the borrowed capital (including deposits) with which these institutions worked in 1904—amounting to . . .

Marks, 123,113,346 (£6,155,667)

The returns of the collective guarantees of the central credit institutions outside the *Reichs-Verband* are incomplete.

The central co-operative agricultural supply associations in direct connection with the *Reichs-Verband* numbered in 1904 twenty-four, with a collective membership of 8,604, of which 5,222 were co-operative societies (3,261 credit societies doing supply business), 1,621 agricultural supply societies, 249 dairy societies, 91 miscellaneous societies), and 3,382 individuals. The collective guarantees of the members, on the security of which the credit dealings of the central association were mainly based, amounted to 21,566,500 marks (£1,028.325). The collective paid-up capital, including paid-up shares and accumulated profits placed to reserve amounted to 3,528,682 marks (£176,434).

profits amounted to 1,165,842 marks (£58,292), most of which was placed to reserve. The periods for payment by members to central societies vary from fourteen days to six months; the rate of interest on outstanding accounts from 4 per cent. to 5 per cent. The average expenses of management of all the central supply associations amounted to 1.49 per cent. of the cost of supplies (0.02 per cent. of the turnover). The expenses of some of the older associations doing the largest business were considerably under the average, e.g., Cologne, 0.79 per cent.; Berlin, 1.01 per cent.; Halle, 1.16

per cent. (of the cost of supplies), while those of some of the associations doing a smaller amount of business were considerably over the average, e.g., Wiesbaden, 3.85 per cent.; Friedberg, 3.38 per cent.; Strassburg, 3.97 per cent.

The supplies obtained in 1904 are classified as follows:—

Manures.	13,574,068	cwt.	(as	against	11,499,255	in	1903).	
Feeding Stuffs.	3,758,415	cwt.	(	**	3,122,260		,, ´)	١.
Seeds,	129,837	cwt.	(	,,	92,513		,, )	١.
Fuel.	10,644,704	cwt.	(		9,706,627		)	١.

The agricultural supplies obtained by co-operative methods in the German Empire, including those obtained by individual cooperative societies direct, without the intervention of central societies are estimated as follows:—

Total,	Marks,	150,100,000	(£7,505,000)
Other Associations,	,,	<b>2,</b> 100,000	(£105,000)
League),	. ,,	5,000,000	(£250,000)
chaft (Agricultural Society), Bund der Landwirthe (Agrarian	,,	13,000,000	(£650,000)
ganisation,  Deutsche Landwirthschafts-Gesell-	**	40,000,000	(.£2,200,000)
nected with the Raiffeisen Or-		45,000,000	(£2,250,000)
Societies (central and local) con-	Mai Ks,	, 00,000,000	(24,200,000)
Societies (central and local) connected with the Reichs-Verband.	Morka	85,000,000	(£4,250,000)

Dr. Haas estimates, however, that, large as these sums appear, they only represent about one-seventh of the total purchases of agricultural supplies in the Empire, and that the co-operative movement still has a wide field before it in this matter.

The statistics in Dr. Haas's report as to the co-operative sals of farm produce are confined to the societies affiliated to the Reichs-Verbund (excluding Neuwied), and to the sale of grain and potatoes. The value of the grain sold in this manner in 1904 was 16,063,613 marks (£803,180), and of potatoes 278,488 marks (£13,924).

The central supply associations of the Reichs-Verband undertake analyses for members.

The collective number of investigations made by them in 1904 was 12,100, out of which 4,961 led to the discovery of deficiencies in quality, and enabled the members to recover, collectively, from the suppliers 144,216 marks (£7,210) distributed as follows:—

In a previous issue of this *Journal* (Vol. IV., No. 2, p. 229), a table was given showing the progressive increase of the funds provided by the co-operative societies themselves in response to the

copious but carefully administered State aid granted to the central co-operative credit associations in the states of the German Empire since the Prussian (Government) central co-operative bank and similar agencies began to give such aid on a large scale in 1896.

This table is now brought up to date as follows:---

YEAR.	Paid in by Societies.	Borrowed f <b>rom</b> Banks,	Total.	Percentages furnished by the Societies.
1000	£	£	£	04 570/
1896	365,716	692,246	1,057,963	34.57%
1898	1,262,357	792,545	2,053,903	61.46%
1900	1,567,147	728,843	2,295,991	68.25%
1902	3,615,182	496,293	4,111,475	87.93%
1903	4,640,164	458,357	5,098,521	91.01%
1904	5,198,154	445,528	5,643,683	92.11%

NOTE.—The discrepancies between the figures in the second and third columns of this table and those in the fourth column, and similar discrepancies in other figures in this article, are due to the omission of odd shillings in converting Marks into Pounds.

The following table extracted from the Report of the Prussian (Government) Central Co-operative Bank for the year ending March 31st, 1905, shows the same tendency as regards the central co-operative credit associations in the kingdom of Prussia. The transactions summarised in this table include those with co-operative institutions of urban character, but these only amount to about 15 per cent. of the whole.

Summary in round numbers, of the transactions in the way of current account and "Lombard" loans between the Prussian (Government) Central Co-operative Bank, and the central co-operative credit institutions in the kingdom of Prussia:—

YEAR.	Balance of outstanding Loans and Overdrafts brought over from previous Year.	New Loans and Advances.	Total of Loans, &c	Repayments and Deposits.	Balance.
1897 1898 1899 1900 1901 1902 1903 1904	£ 1,038,100 929,250 1,114,750 1,242,900 1,213,250 436,400 333,450 394,050	£ 5,064,000 6,913,650 7,401,300 9,581,400 11,411,450 13,701,250 14,752,900 17,758,550	£ 6,102,100 7,842,900 8,516,050 10,824,300 12,624,700 14,137,650 15,086,350 18,152,600	£ 5,172,850 6,728,150 7,273,150 9,611,050 12,188,300 13,804,200 14,692,300 18,079,400	£ 929,250 1,114,750 1,242,900 1,213,250 436,400 333,450 394,050 73,200

The security on which the German co-operative societies obtain funds, whether in the form of deposits or in that of advances from or through the central credit institutions, and on which Government funds are placed at their disposal through the central credit institutions, consists mainly of the personal guarantees of the members. In the majority of cases, especially as regards the credit societies, this takes the form of joint and several unlimited liability. The percentage of societies in which the form of limited guarantee is adopted is, however, steadily increasing, especially as regards dairy societies, supply societies, and miscellaneous societies. The guarantee in these cases is usually very substantial, as was shown in some detail in No. 2, Vol. IV., of the Journal, varying from an amount equal to that of the shares held to fifty times that amount, and even more.

The figures up to July 1st, 1905, are as follows:---

		Un- limited liability (in both forms).*	Per Cent.	Limited liability (guaran- tee),	Per Cent.	Total	Per Cent.
Credit Societies. Supply Societies, Dairy Societies, Miscellaneous Societies,		12,286 1,092 1,902 480	93·2 58·5 67·2 33·3	895 775 930 963	6 · 8 41 · 5 32 · 8 66 · 7	13,181 1,867 2,832 1,443	100 100 100 100
Total,		15,760	81.5	3,563	18.5	19,223	100

The percentages for the previous years were:—

			Unlimited Liability.	Limited Guar <b>ant</b> ee.
1904,	• •		82 · 1	17.9
1903,			$82 \cdot 8$	17.2
1902,			83.8	16.2
1901,	••	• •	85.0	15.0
1900,	• •	••	87.5	12.5
1899,	••		88.2	11.8
1898,	••	• •	88.6	11.4
1897,	••		89.0	11.0

<sup>\*</sup> Unbeschrünkte Haftpflicht and Unbeschrünkte Nachschusspflicht (see the Department's Bulletin, No. 2, Miscellaneous Series, 1902, p. 15).

Doubts had been entertained for some time as to the realisability of some of the claims carried forward from year to year as assets in the balance sheets of the central agricultural credit and supply institution (Landwirthschaftliche Central-Darlehns-kasse) at Neuwied.

A thorough investigation was made in the spring of this year and all doubtful claims written off, either as bad debts, or as claims which it would be undesirable to enforce against the affiliated societies debited with them-societies now doing useful work, after having come through difficulties which rendered the repayment of their liabilities to the central institution impossible wthout seriously crippling their operations. The net profit shown in the balance sheet for 1903 (see Journal for Oct., 1904, Vol. V., No. 1, pp. 39 and 40) was £12,037—on a gross turnover on all accounts of £33,000,000—and a paid-up share capital of £408,750. The balance sheet prepared on the same principle for 1904 showed a net profit of £29,669, but the claims written off under the above-mentioned heads amounted collectively to more than £40,000, so that a large portion of the reserve, as well as the whole of last year's profits, was On the other hand, it is to be observed that the affairs of the institution have been so managed that no individual creditor or member of any of the societies affiliated to it has ever lost a penny by transactions directly or indirectly connected with it, while many co-operative undertakings which, without the aid of the central institution at Neuwicd, would have had to be wound up, have been helped over initial difficulties by advances, and are now doing useful and beneficent work. Upwards of £19,000 out of the £40,000 odd above mentioned represents the arrears due from the co-operative manure manufactory "Unitas," started by a number of co-operative societies in 1895, and subsequently taken over, when in difficulties, with its liabilities, by the central credit and supply institution. Up to 1902 this undertaking was carried on at a loss. Since that date it has yielded a profit. In order that the co-operative societies and their members may derive the largest possible benefit from the existence of such an undertaking, it has been thought expedient that the advances with which it stood debited in the accounts of the central institution should be written off. Dr. Heiligenstadt, president of the Prussian (Government) Central Co-operative Bank, who has personally investigated the affairs of the Neuwied central agricultural credit and supply institution, has congratulated the directors thorough and uncompromising way in which they have purged their books of all doubtful claims, pronounced the present

position of the institution to be sound, and prophesicd a prosperous and useful career for it in the future. It is understood that the satisfactory clearing up of the affairs of the Neuwied institution is largely due to the action of the Prussian (Government) Central Co-operative Bank (which had large dealings with it), and the moral may perhaps be drawn that it is desirable that institutions of this character, engaged in such large and multitudinous transactions affecting the welfare of so large a number of persons engaged in agriculture, should be subject to constant and effective Government control.

H. DE F. MONTGOMERY.

# THE NATIONAL IMPORTANCE OF FORESTRY.

There are many who do not recognize the importance of a proper proportion and distribution of forest or woodland in an inhabited country, or the fact that the destruction of extensive forests is the first step in the making of a desert or waste. Yet the history of the world reveals over and over again that wherever forests have existed, and have been subsequently destroyed by human agency, changes of climate or in the fertility of the soil have resulted which have often been disastrous in their effect.

The influence of forests upon climate depends a great deal upon

latitude, upon the existence of bodies of Forests and Climate. water or mountain chains, and upon wind currents. Latitude determines to a great extent the extremes of heat and cold to which a country is subjected, but these extremes are often modified by the proximity of seas or large lakes, by prevailing wind currents, and other phenomena. In Ireland, for instance, the climate is chiefly influenced by the prevalence of westerly winds from the Atlantic, which are usually moist and warm, and which thus give rise to a comparatively humid atmosphere throughout the year and cause a fairly heavy rainfall. The existence, or non-existence, of forests in such a country, therefore, is probably of little importance in influencing the climate generally. But the local influences of extensive tracts of woodland are sufficiently great to be felt Local Influences. even when the general climate is not altered by them. The chief local effect of woodland consists in its power of converting a wet and cold surface, such as bog marsh or moorland, into a comparatively warm and dry one. It has been proved by careful experiments and shown by observations made in the large forests on the continent of Europe that a surface covered by trees in such a way that the crowns or tree tops form a continuous canopy, is not affected by wind, sun, or frost to the same extent as the surface of the open ground. In open areas, as is well known, heat and cold reach their maxima at the surface, which is warmer by day and colder by night than the air above it. On a dry surface a considerable amount of heat is absorbed by the soil during a hot day, part of which is retained

beneath and part radiated from the surface at night. On a wet, swampy surface, on the other hand, heat is used up in evaporating the water before the temperature of the soil can be raised to any appreciable extent. Thus the tendency for a warm day to be succeeded by a comparatively warm night, as is the case on well-drained soils, does not exist, while there is a greater probability of night frosts in spring and autumn, and a colder and damper atmosphere by day.

In areas under woods, apart altogether from the effect of the trees upon the surface conditions, which will be dealt with later, the rays of the sun are reflected to a great extent from the twigs and foliage, and thus the air is warmed, while a certain amount of heat is absorbed by the trunks in winter, or in the process of assimilation in summer. But the chief point to notice is the fact that the greater part of the sun's heat is not lost, as in the case of a swamp, by evaporating the moisture, but is available for rendering the dry temperature warmer, and to some extent drier. With a large extent of very dry soil, as often occurs in tropical regions, the reverse of this takes place, and forests there tend to render the atmosphere cooler and moister; but in the British Islands such conditions are exceptional and need scarcely be considered.

Attention has been chiefly drawn to the above facts for the pur-

### Forests and Rainfall.

pose of correcting an impression which largely prevails regarding the connection between forests and rainfall. It is often stated that forests tend to increase the rain-

fall of a country, and render it colder and damper. In a tropical region this may be the case, because there, not only is the temperature of the forest, beneath the tree-tops, cooler than that of the air directly exposed to the sun's rays, but the tree tops themselves are colder than the bare or open surface. A moist current of air passing over a forest is, therefore, more readily condensed into rain by contact with the trees themselves, and also because it is forced to move at a higher level than when no obstacles are in its way. But even here the effect of forests upon rainfall is probably infinitesimal compared with that of a mountain range or large inland lake, and the existence of forests in the tropics is more often the result of the heavier rainfall than the cause of it. But in temperate climates, and in the British Isles at any rate, the difference

between air temperature and humidity in a forest and that in the open country is so slight that no connection can possibly be traced between the existence of woods and the average rainfall. It is quite possible that showers may be more frequent and the dew fall heavier in the vicinity of woods in dry weather, but any influence they exercise in this direction must be considered beneficial rather than otherwise.

The great and most important function of forests in any country,

Forests, Soil Erosion. of Water.

however, lies in their influence in regulating the flow of springs and rivers, and in preand the Distribution venting soil erosion or surface denudation. The immediate effect of forest destruction in all mountainous countries has invariably

been the drying up of springs and rivers in summer or dry seasons, their conversion into torrents in wet periods, or during heavy storms, and the washing away of the surface soil on slopes or hill sides at a more or less rapid rate. The steeper the hills and the greater the tendency for wet and dry periods to be prolonged and intensified, the more rapid the rate at which comparatively fertile land is reduced to absolute sterility. In Ireland or Great Britain, a comparatively moderate rainfall, distributed with tolerable uniformity throughout the year, encourages surface growth and diminishes periodic floods. But the ultimate effect is the same in every country where the surface rises into hills, or where the soil is of a sandy or open nature.

On all bare hill sides or mountain slopes heavy rain invariably falls at a faster rate than its absorption by the surface soil can proceed. The water consequently collects into hollows or depressions, becomes converted into rivulets, and these increase in volume and velocity as they descend the hill. These rivulets break through any thin turf or surface growth which may have formed in dry weather, deepen their channels as they descend, and ultimately develop into ravines or gullies, which cut down to the solid rock. The process thus begun is continually being extended by the formation of tributary channels feeding the deeper ones, and branching off to right and left like a network of drains.

With a covering of forest trees, on the other hand, soil erosion is prevented in several ways. To begin with, heavy rains are broken by the twigs and foliage, and their descent to the ground is moderated. Another and more important factor is the condition

27

of the surface. In a thick wood this consists of dead leaves and twigs, which act partly as a sponge in retaining the rain water and partly as a sieve in passing it slowly down to the surface soil beneath. This humus layer, as it is termed, is additionally beneficial in preventing the surface from becoming hard and baked, and the rain which finally reaches it, sinks in without difficulty. Another obstacle to soil erosion is the network of roots which binds together the first foot or so of surface soil, and which checks any excessive denudation, even with a bare surface.

Not only is the soil already existing preserved in the way described above, by the presence of trees, but its formation out of the subsoil or rock below is hastened. The top roots and stronger side roots push their way into cracks and crevices of the rock surface, push them wider apart as they grow, and when they ultimately die and decay, leave a quantity of vegetable matter which acts, through the carbonic acid it evolves, as a solvent of the rock in contact with it. An important aid to the breaking up of rock surfaces is further afforded by the powerful leverage exerted by the roots when the trees are swayed by the wind, the effect of which increases with the size of the trees.

The effect of forests in the regulation of springs and the flowing of rivers, and the prevention of destructive floods in the lowlands and valley result simply from the gradual soakage of the rain from the surface to the subsoil, where it collects in under-ground channels and reservoirs from which springs are fed, and rivers in their turn kept at a uniform level. These facts are being recognised in a practical way by the municipal authorities of Leeds, Liverpool, and other large towns, by the purchase and afforestation of a large portion of their catchment areas, and there is little doubt that their example will have to be followed by others in the future.

The effect of woodland growth in preventing stagnant water on the surface is also fairly obvious when the above facts are borne in mind. To begin with, a wet hillside or moorland may require artificial draining, but when once the trees have become established, and their roots have penetrated the soil in all directions, the collection of surface water is prevented, and no artificial assistance is necessary. In forests left entirely to nature, and in which the trees are allowed to die and decay on the ground, swamps are often formed by the accumulation of vegetable matter on the surface, and the formation of what is known as "raw" humus. But in

woods properly managed it is an everyday experience to find the remains of old drains, made when the woods were first planted, perfectly dry, although full of decaying leaves and rubbish. Where springs break out on the surface, of course water will always collect unless carried away artificially or in natural channels, but this does not affect the general truth of the statement that woods tend to dry the surface, and indirectly the climate, rather than the reverse.

Serious as the effects of soil erosion or denudation may be, almost equally serious is the loss in fer
Forests and Soil tility which takes place in certain soils when robbed of their tree growth and subsequently left to themselves. It is a

fact well known to every agriculturist, that all sandy soils, or those of an open, porous nature will not produce a close turf or nutritious pasture unless frequently manured, cither artificially or through cake-fed stock. Soluble plant food, which is kept near the surface in more retentive soils, and there taken up by the roots of such shallow rooters as grass, is in those quickly washed down into the subsoil in wet weather, while in dry periods or seasons they do not contain or retain sufficient moisture to render this food capable of being taken up by the roots. Cultivation remedies this to some extent by turning over the soil and affording the farmer an opportunity of growing deep-rooting annuals or plants with different mineral requirements in rotation. But on land which cannot be cultivated, either owing to the slope of the ground, or the presence of rocks or boulders, deterioration is the inevitable result when left to itself. Nature, it is true, often finds a remedy by covering such ground with gorse, broom, or even forest trees, such as birch or Scotch pine, but so far as the agriculturist is concerned the ground so covered is lost.

But in the absence of such growth the general tendency appears to be for grass to die out, and heather, with its deep, wiry roots and capacity for growing on the poorest soil, to take its place. As time goes on, peat is formed beneath the heather, which, as it increases in depth, renders the growth of all other plants a matter of great difficulty, and, in a wet climate, leads to the formation of wet moorlands.

In every country, therefore, which possesses hill ranges, or tracts of sandy soil, it appears to be a law of nature that certain ground

must either be cultivated by man, or covered with forests or scrub if deterioration and absolute sterility are to be avoided. Possibly limestone formations are to some extent an exception which proves the rule, for on limestone a short, thick turf often covers the hill slopes. But even on limestone, steep hills can only be adequately protected against erosion, and the valleys beneath from flooding by deep-soiling plants, amongst which trees can alone be considered as factors in augmenting the national wealth.

So far only the physical effect of forests upon the condition of a country has been considered. Of equal im-The Economic Aspect portance to the population and the national of Timber Growing. wealth and prosperity are the opportunities they afford for the profitable cultivation of otherwise waste lands and the raw material they provide for the development of industries.

It has already been pointed out that on certain classes of land trees are the only form of vegetation which Timber as a Crop

### on Poor Land.

can support itself. On land of this character, too, only trees can prevent the soil from deteriorating, or being washed away from

But it is equally important to know the mountain slopes. that woods constitute a crop which has a higher marketable value than any other which it is possible to grow under such conditions. The grazing value of mountain slopes rarely exceeds 2s. 6d. per acre, even under the most favourable circumstances. With a properly grown crop of timber trees, an annual net return of 5s. to 10s. per acre should be easily obtained, although this return is delayed for a long period, and can scarcely be regarded in the same light as the cultivation of farm or garden crops by the ordinary landowner or occupier. But the importance of the question from the point of view of national or rural economy is obvious in any country with large areas of waste or semi-waste land, and where the existence of a large rural population is of the first importance.

The extent of land returned as mountain or waste in Ireland is about 2,000,000 acres, exclusive of bog land. How much of this is capable of Waste Land in growing timber at all, or how much will Ireland. grow it at a profit, no one at present knows.

But it is perfectly clear, from the growth made by existing plantations, and the size attained by all the more common timber trees,

that a large proportion of all the mountain ranges are particularly adapted for timber production, while the climate is all that could be desired for promoting a rapid growth. Along the west coastline, and at altitudes much over 1,000 feet above sea-level, probably little could be grown successfully, while the planting of peat bogs is, at the best, a doubtful enterprise. But over and above land of these classes there exists a very large area which only requires to be properly dealt with to turn it into a valuable source of national wealth in the future.

The value of timber as a raw material for the feeding of industries, and its indirect value in providing Industrial Value of employment in rural districts have long been recognized in most European coun-Timber. tries. For the last two hundred years France and Germany have been steadily conserving and adding to their State forests on the one hand, and encouraging the private landowner to develop his woodlands on the other. The general result has been that a large proportion of the timber consumed in these countries has been supplied by the home forests. recognized that practically the whole of the market value of timber is represented by wages paid away in the growing, felling, and conversion of it, and that commercial forestry should be regarded as a public or national institution, rather than an undertaking suited to private enterprise. Vast sums of money have consequently been expended in home labour instead of being paid away abroad, and a healthy rural population exists on land which would otherwise be a desolate waste.

But the benefits of a well-wooded country are not confined to the actual growing and marketing of the timber. They are invariably extended to industries in general, especially such as turning, joinery, chair-making, paper-mills, which use timber as their raw material. The development of these reacts upon trade in general, to the advantage of the national wealth and prosperity.

It is fairly obvious that the success from a commercial point of view of planting waste or land of any kind

Prospective Value turns upon the value of timber, not at the present time, but when that timber will probably be mature. As few kinds of timber can be grown under a period of fifty years, and some not even in that time, it is only reasonable that some attention should be

paid to the prospects which are held out to an individual or a nation when urged to embark upon an undertaking of this kind.

It is a well-known fact that the natural forests of the world are being steadily exhausted of their original stocks of timber, not only by the lumberman or prospector, but to almost as great an extent by destructive fires which burn over thousands of square miles in a few days. The destruction of large areas of natural forests, either by the axe or fire, does not necessarily imply that a timber famine is imminent, or that the supplies of the future are

The Protection and

it certainly indicates the necessity for Renewal of Forests. the artificial protection and regeneration

to be reduced to a dangerous extent, but

many of those forest tracts have hitherto contained natural stocks of timber which were considered inexhaustible. As the old stocks of natural timber are gradually worked further and further from navigable rivers and seaports the cost of transportation will increase. As the population of a forest region increases, the danger forest fires will also increase. Both these contingencies mean that the cost price of timber will steadily increase. At present this is practically made up of the cost of cutting, shipping, and transporting, with whatever profit the shipper can make on it. In the future, to the cost of production will have to be added the expense of cultivation, which has not yet been incurred. This will necessarily mean a general advance in all the more important kinds of timber, such as pine, spruce, and other coniferous woods which form the bulk of foreign imports.

There seems to be a fair prospect, therefore, of timber growing in Ireland or elsewhere proving a commercial success, provided it is carried out on correct lines. But it must be remembered that the growing of the cheaper kinds of timber can only be made profitable when carried out on a large scale. The complaint is frequently

made by those having timber to dispose of Can Timber Growing that the price they are able to obtain for it is be made Profitable? totally inadequate, and disproportionate to the cost of producing it. No doubt this often is so, but when the whole of the circumstances are known it is usually found that low prices are due to one or other of the following causes, or, possibly, to a combination of them all.

In the first place, the timber is usually offered in comparatively small quantities-too small to make it worth the while of a timber merchant who makes a speciality of that particular timber to lay down a sawing plant on the spot to work it up. The result is, it must be sold to a general buyer, who often buys on the chance of turning it over at a profit as it is, but without any definite prospect of doing so at the time. He must, therefore, buy cheaply to insure himself against loss, and this is often at a price which is far below its true value in a proper market.

Secondly, the timber is probably growing or lying at a long distance from a railway or consuming centre, and the cost of carriage from the wood to its destination in its unconverted state must be allowed for. A great deal of Irish timber is exported to England, which means a very heavy outlay in carriage alone, besides the great disadvantage it suffers from passing through ports which have every facility for obtaining cheap foreign supplies.

A third, but frequent cause of unsatisfactory prices of timber is often the rough and inferior quality of the timber itself. This is especially likely to be the case with birch, spruce, silver fir, &c., all of which require growing in close order, to render them clean, straight, and free from dead and coarse knots.

Other reasons might be given, but the above are sufficient to account for low prices in most districts, where the cheaper kinds of timber are grown in small quantities or in small plantations, as is usually the case on private estates. Under present conditions, larch and ash alone can be grown in small quantities, and sold at a price which is at all remunerative to the grower, but ash, at any rate, will not grow on all soils and situations, and larch is not always to be depended upon. The greater part of the waste land of Ireland is adapted for conifers only, or such hard woods as beech or Spanish chestnut, and whatever planting is done on a large scale must rely to a great extent upon these trees.

It has been repeatedly shown, however, that a regular supply of timber of any kind creates a demand for it, and leads to the springing up of manufactures and industries which with a small and uncertain production of wood, could not have been carried on. It is equally a matter of experience that the cost of growing timber, per cubic foot, ton, or acre, as the case may be, is very much less (probably 50 per cent.) on a large scale, than on a small one. Fencing, planting, felling, and conversion are all reduced when the work is carried out over a great area, and the advantages thus gained may make a difference between a substantial profit and a dead loss.

Any well arranged scheme of replanting or afforestation of waste land, therefore, which provides for the formation of large and compact blocks of two or three thousand acres of woodland, is likely to be commercially successful, although State aid in some shape or other may be an absolute necessity at the outset.

The above are a few of the advantages which follow, and the points which require attention in the adequate afforestation of a district, isolated examples of which occur here and there in England or Scotland. But they are so few and far between that they scarcely affect the truth of the statement that forestry, in its commercial or economic aspect, scarcely exists in Great Britain or Ireland, although the climate, conditions of labour in rural districts, and the existence of vast areas of waste or semi-waste land suitable for planting, all combine to render the question of afforestation one of the greatest importance.

# THE POSITION OF IRISH AGRICULTURE IN THE YEAR 1904.

It appears from the Detailed Report on the Agricultural Statistics for the year 1904, which has been recently isued by the Department of Agriculture and Technical Instruction for Ireland (Cd. 2722—1905), that the general economic character of the distribution of the area of Ireland in 1903 and 1904 was as follows:—

	1903.	1904.	Increase.	Decrease.	Net Change.
Crops, Coreals (excluding Hay),	1,306,345	1,279,189	_	27,156	
Crops, Roots, and Green,	1,059,783	1,050,483		9,300	
Flax,	<b>44,6</b> 85	44,293	<u> </u>	392	36,848
Hay (on rotation Land),	627,259	631,748	4,489	- 1	
Hay (on Permanent Meadow),	1,596,906	1,628,41 <b>2</b>	31 <b>,50</b> 6	-	+ 35,995
Pasture (Temporary rotation),	608,776	647,416	38,640		
Pasture (Permanent),	9,988,945	9, <b>939</b> ,223		49,722	11,082
Small Fruit,	4,591	4,512	_	79	- 79
Fallow,	5,131	4,848	_	283	<b>— 283</b>
Woods and Plantation,	304,052	303,118		934	934
Bog, Waste, Barren Mountain, Water Marsh, &c.,	4,804,252	4.817,483	13,231		+ 13,231
	20,350,725	20.350,725	i		

From the above statement it will be seen that in the land under crops—other than hay—there has been in Crops.

1904, compared with 1903, a decrease in the total crop acreage of 36,848 acres. On the other hand, there has been an increase of 35,995 acres in the area under hay, of which increase 4,489 acres were on rotation land, while 31,506 acres were on permanent meadow. As regards pasture, it will be seen there is a net decrease of 11,082 acres—due to the shrinkage in the area of permanent pasture—while in the case of bog, waste, and barren mountain, a considerable increase is shown.

With regard to changes in the crop areas shown, the decline of

#### Changes in Crop Areas.

36,848 acres in 1904 consists of a fall in the acreage of cereals to the extent of 27,156, of 9,300 acres in the case of green crops, and

of 392 acres in the case of flax. The following table shows the areas under the several cereal and root crops and the flax crop in 1903 and 1904:---

-	1903.	1901.	Increase or Decrease.		1903.	1904.	Increase or Decrease.
1	Acres.	Aeres.	Acres.		Acres.	Acres.	Acres.
Wheat,	37,596	30,825	6,771	Potatoes,	620,393	618,540	1,853
Barley,	158,712	158,043	- 669	Turnips,	287,548	285,831	-1,717
	100,714	100,043	- 009	Mangels,	<b>75,998</b>	75,746	-252
Oats,	1,097,538	1,078,772	- 18,766	Beet,	76	82	+6
Bere,	79	60	-19	Carrots,	2,118	2,111	-7
Ryc,	10.050			Parsnips,	796	616	180
Rye,	10,050	9,414	636	Cabbage,	44,545	39,665	4,880
Beans,	2.080	1,890	-190	Vetches,	2,662	2,761	+99
Pease,	290	185	-105	Rape,	3,772	3,481	291
			2.70	Others,	21,875	21,650	-225
Total Cereal	1.306.345	1,279,189	-27,156	Total Root / Crops.	1 059,783	1.050,483	-9,300
Crops.	T.OOO,OTO	1,210,100	-27,100	Flax,	44.685	44,293	-392

The season 1904 was, on the whole, much better than that of

## Produce of the Crops.

1903. In the earlier part of the year there was a fair amount of rain, while in the later part of the summer the weather was dry. The year was especially favourable to roots.

As regards cereals, owing to the dryness of the latter part of the season, the grain did not "fill out" according to expectations, and this was especially seen in the case of barley. On the other hand, the dry season was particularly suitable to wheat as also to flax, in each of which crops a heavy yield per acre was obtained, though not equal to the exceptional return of the year 1902. The following table shows the estimated average produce for the principal crops, per statute acre:—

		Estimated Average Produce per Statute Acre.									
YEARS.	Wheat.	Oats.	Barley.	Bere.	Rye.	Pota- toes.	Tur- nips.	Mangel Wurzel and Beet Root.	Cab- bage.	Flax.	Нау.
1903, Average 1894-1903, 1904,	Cwts., 112 lbs. 16'8 17'3 18'1	Cwts. 112 lbs. 15'3 15'5 15'9	Owts. 112 lbs. 164 175 149	Cwts., 112 lbs. 158 136 14:5		Tons. 3.8 3.8 4.8	Tons, 12.5 14.9 17.5	Tons. 13.5 16.3 17.6	Tone. 97 100 108	Stones. 14 lbs. 30'9 29'9 38'7	Tons. 28 28 24

The following table affords an estimate of the value of the principal root and cereal crops in Ireland Estimated Value of the in 1904. It does not, however, include the Irish Crops. minor green crops, beet-root, carrots, or cabbage, which aggregate in 1904 a total of nearly 500,000 tons, nor may the estimate arrived at be regarded as anything more than a broad approximation of value:—

QUANTITY and VALUE of the principal IRISH Crops in 1904.

Cı	op.			Estimated Produce in 1904.	Average Price.	Estimated Value of Crops.
				Thousand Cw1.	Per Cwt.	Thous <b>an</b> d £.
Wheat,	•••	•••		557	7 1	198
Oats,	•••			17,183	5 64	4.761
Barley,				2,348	7 21	846
Bere and Ryc.	•••	· •••		123	6 6	40
Beans and Pease,				42	6 6	14
Flax,				187	54 6	<b>6</b> 10
				Thousand Tons.	Per Ton.	
Potatoes,		•••		2,642	8. d. 45 0	5, <b>945</b>
Turnips,		•••	•••	4,997	12 0	2,998
Mangold,				1,332	15 0	909
Hay, Rotation.				1,441	65 V	4,685
" Permanent	Pastu	re,	•••	4,045	45 0	9,102
Total estimated	Value	of the C	rops,		_	30,098
1						

The changes which have taken place in the live stock of the country are in no way so remarkable as those seen with regard to crops, but they are not inconsiderable and are of great interest.

The nature of the developments which have been at work may be in part shown by comparative tables of the several classes of stock in the Census years from 1851 to 1901. At the same time it will be remembered that statistics of numbers are only one index of

change, and that the improvement in stock, which can only be indicated, and then insufficiently, by careful records of weights and prices, is equally if not more important.

Years.	Horses.	Mules.	Asses,	Cattle.	Sheep.	Pigs.	Goats.	Poultry.
1851	521,706	21,606	136,981	2,967,461	2,122,128	1,084,857	235,313	7,470,694
1861	614,232	20.146	173,711	3.471,688	3,556,050	1,102,042	189,842	10,371,175
1871	538,095	19,817	180,373	3,976,372	4,233,435	1,621,423	231,373	11,717,182
1881	548,354	26.392	187,143	3,956,595	3, <b>256,18</b> 5	1,095,830	266,078	13,972.426
1891	592,819	28,660	216,268	4,448,511	4,722,613	1,367,712	336. <b>33</b> 7	15,276,128
1901	56 <b>4</b> ,916	28,882	238,980	4,673,323	4,378,750	1,219,135	312,409	18.810,717
1902	579,765	29.397	242,862	4,782,221	4,215,865	1,327,610	303,654	18,504,324
1903	595,746	29,795	243,241	4.664,112	3.944,604	1,383,516	299,120	18,153,714
1904	604,930	29,931	244.145	<b>4</b> ,6 <b>76</b> ,7 <b>1</b> 8	3,827,919	1,315,126	290,222	18,256,959
		1						

The following summary presents the changes in the size of hold-Holdings and ings in 1903 and 1904:-Occupiers.

	s	liz <b>e o</b> f Holdir	ıcısı.		Number	Number	Increase or Decrease in 1904.		
	Timo of Timunga.				in 1903.	in 1904.	Increase.	Decrease.	
Not ex	rceeding	1 Acre,	***	•••	74,890	75,701	811	_	
Above	e lan	d not exceedi	ng 5/	Aeres,	62,292	62,185		107	
,,	5	11	15	<b>,,</b>	154,631	154,290	-	341	
17	15	••	30		134,308	134,480	172	_	
"	<b>3</b> 0	11	50	<b>,.</b> '	74,366	74,329	_	37	
**	50	**	100	,,	57,446	57,683	237	_	
••	100	**	200	,,	23,058	22,933	_	125	
,,	200	11	500	.,	8,141	8,096	_	45	
Above	e 500 Ac1	·es,	•••		1,516	1,527	11	_	
		Total,	•••	•••	590,648	591,224	576	_	

From this statement it will be seen that the most noticeable features in 1904 are the increase of holdings under one acre, the

decrease in the holdings above 5 and under 15 acres, and the increase of holdings above 50 and not exceeding 100 acres.

Ulster is pre-eminently the province of small holdings. Altogether it has in 1904 only 19,433 holdings exceeding 50 acres in extent, whereas it contains 162,251 holdings of an extent above 1 and not exceeding 50 acres. Moreover, of these the greater number are between 5 and 30 acres in area. On the other hand, Munster is pre-eminently the province of holdings between 30 and 200 acres. In 1904, of its total number of holdings exceeding one acre, viz., 113,412, no less than 54,515 were of a size above 30 and not exceeding 200 acres. Further it may be noted that among these holdings the proportion not only of those above 50 acres, but of those exceeding 100 acres in area is, when compared with the other provinces, relatively large. In Leinster there is no such predominance of small or large holdings, but every class is well re-Leinster has, however, the largest number of holdings, exceeding 200 acres. In Connaught the most striking feature is the contrast, marked even more strongly than in Ulster, between the large number of holdings from 5 to 30 acres in extent, and the small number between 30 and 100 acres. To the former class belong about two-thirds of the total number of holdings in Connaught exceeding one acre, whereas of holdings from 30 to 100 acres there is a much smaller proportion than in any other of the provinces. On the other hand, Connaught has the largest number of holdings " above 500 acres."

REPORT UPON EXPERIMENTS MADE IN THE ROYAL VETERINARY COLLEGE, DUBLIN, ON TWO HORSES OBTAINED FROM A STUD INFECTED WITH GLANDERS.

Two animals, a bay or brown gelding and a black filly, were sent

# The Objects of the Experiments.

into the College for observation and experiment. Both animals came from a stable where Glanders had been discovered, and it was thought advisable to subject both animals to experiment to determine (1) if they

had Glanders; (2) if Glanders were present would the free use of Mallein mave a curative effect upon the lesions; (3) if Mallein was injected at short intervals would a tolerance or immunity to Mallein be set up; (4) if the animals ceased to react to Mallein during the earlier part of the experiment would such cessation of reaction indicate recovery from the disease, and, if so, would the lesions be sterile—in other words would the animal cease to be a possible source of infection to other horses if it were allowed to reenter the stud and resume work.

The use of Mallein as a diagnostic re-agent has long passed out

#### The Mallein Test.

of the experimental stage, and it is a diagnostic agent when used judiciously and by expert hands, the value of which it would be difficult to estimate. Though it may not

be infallible, it is sufficiently precise and exact, as numerous experiments, clinical evidence and post-mortem records amply show, to give rise to the grave suspicion that a lesion has been overlooked if after a typical reaction to Mallein the post-mortem examination does not reveal a lesion of the disease. It may be mentioned that after an injection of Mallein a horse infected with Glanders, even if there is no clinical evidence of Glanders, shows the following, which constitutes what is known as a typical reaction—(1) a local swelling, painful and increasing in size for forty-eight hours or more, at the site of injection of the Mallein; (2) a temperature reaction, the animal's temperature rising 3°, 4°, or 5° F. during the first eighteen hours following injection; (3) a general reaction as shown by constitutional disturbance. The first two are important and are chiefly looked for after the injection.

In all five injections were made into each animal, the first four at intervals of a week, then about three months were allowed to elapse before the last injection was made, and the animals examined post-mortem. The Mallein used at the first four injections was prepared at the Pasteur Institute of Paris, that employed at the last testing was prepared in the Royal Veterinary College of Ireland from organisms isolated from animals from the same stud killed when suffering from Glanders in February, 1905.

The results of the injections were uniform in both animals, the bay gelding was undoubtedly Glandered; the black filly was free from Glanders and did not respond at all. The chart of the gelding was thoroughly typical of Glanders, the steady, consistent rise of temperature, the regular decline to the approximately normal, the character of the swelling, hot, painful, gradually increasing in size for forty-eight hours or so, its diffusion, and disappearance by the fourth day. The constitutional disturbance, though perceptible because it was closely looked for, was not very pronounced. The bay gelding, whilst under experiment, developed Farcy in the hind limbs, first in the off hind leg, then in the near, but the lesions healed, and when the animal was slaughtered all signs of Farcy had disappeared save for enlargement and some induration of the deep inguinal lymphatic glands.

The black filly did not respond to Mallein. In common with other animals injected with Mallein, there was a local temporary swelling at the site of injection. The swelling, however, is less than in a case of Glanders; it is painless, does not increase in size after the first few hours, and disappears rapidly. An interesting fact in support of this may be quoted. A photographic record of the local reactions was taken. The swelling was photographed at 2 o'clock and was quite in evidence, but at 3 o'clock it had disappeared; in the case of the bay gelding, however, the swelling persisted for more than two days longer. The reaction of the black filly to the Mallein was precisely similar to that of a bay mare belonging to the College and known to be free from Glanders. The mare was injected as a control, the local reaction developed a small puffy swelling which soon disappeared. The contrast between the small painless evanescent swelling of the non-glandered and that of the hot, painful, persistent and large swelling of the glandered is most marked.

I thought it would be interesting to note the effect, if any, of Mallein, injected into an animal after it had received an injection

of a killed culture of glanders bacilli. Accordingly I injected into the jugular vein of an aged black gelding 5 c.c. of an emulsion of the Glanders bacilli, grown upon solidified egg medium—the bacilli had been killed by boiling for half an hour. A guinea pig was inoculated at the same time as a control to the culture. inoculation into the guinea pig was negative, proving that all the bacilli were dead. The horse had been tested previously with Mallein and had not reacted. The injection of the dead Glanders bacilli did not cause any inconvenience; the animal's temperature remained normal. Three days later it received a dose of Mallein in the usual way, and though the temperature was taken hourly there was no reaction detected by the thermometer, the highest temperature recorded being 101.5 at the 23rd and 24th hours. Injection of dead Glanders bacilli, which doubtless were still in the blood stream, in the lungs possibly, did not cause any reaction to Mallein. The animal was killed nine days after receiving the dead culture, but no lesions could be discovered after a minute and prolonged search. It is known that dead Glanders and dead tubercle bacilli are capable of exciting the development of anatomical tubercles in the lungs, inducing a reaction on the part of the tissues to the irritation produced by the bodies of the dead organisms or the toxins they contain. Of course there can be no proliferation of the bacteria because they are dead. In our case, however, there were no lesions found, possibly too few bacilli were used, or the emulsion was sufficiently fine to allow the bacteria to pass through the pulmonary vessels.

As mentioned previously, each animal received five injections of
Mallein, the last one in each case three

Some Results of the months after the first series of tests. The
results I give in the following table:—

1ST INJE	CTI	ON,	•••	•••		Bay Gelding.	Black Filly.
Date,		•••	•••	•••		27th February, 1905.	27th February, 1906
Temţ	er	iture at	time of	Injecti	ion,	102·0° F.	100∙5° F.
After	8	hours,	•••	•••		104·5° F.	100·3° F.
,,	11	,,	•••			105.4° F.	100·7° F.
**	15	,,	•••			105·2° F.	100 · 0° F.
**	18	,,	•••			104·7° F.	100·0° F.
Local	Re	action,		•••		Hot and painful. Large.	Slight. Painless.

			:		
2ND INJECTION.	•••	•••		Bay Gelding.	Black Filly.
Date,	•••	•••		March 6th, 1905.	March 6th, 1905.
Temperature at I	njection.			101·0° F.	100·3° F.
After 8 hours,		•	!	102·4° F.	101 ⋅0° F.
,, 12 ,,				104·8° F.	102·6° F.
" 15 "	•••			103·7° F.	101 ·8° F.
"18 "		•••		103·4° F.	101 · 6° F.
Local Reaction,		•••		Painful. Marked.	Painless. Slight.
3RD INJECTION,		•••		Bay Golding.	Black Filly.
Date,				March 13th, 1905.	March 13th, 1905.
Temperature at I	njection,			102·6° F.	100·6° F.
After 8 hours,				103·7° F.	100·2° F.
., 10 .,				104 · 5 · F.	_
., 12 .,				103·6° F.	100 ⋅ 8° F.
" 15 "				103·0° F.	100 · 4° F.
"18 "				102.0° F.	100·7° F.
Local Reaction,	***	•••		Typical,	No remarks.
4TH INJECTION,				Bay Gelding.	Black Filly.
Date	•••			March 20th, 1905.	March 20th, 1905.
Temperature at I	njection,			101 · 6° F.	100·3° F.
After 9 hours,				103•4° F.	99·6° F.
, 12 ,	•••			104 <b>·4</b> ° F.	100 · 5° F.
. 15 .,				103 · 0° F·	100·2° F.
., 18 ,,				102·4° F.	100·7° F.
Local Reaction,	•••	•••		Typical.	No remarks.

From the above it will be observed that the gelding responded on every occasion both to the thermometer and locally, whilst the filly did not. Further, unlike the results following the use of tuberculin, no tolerance to the use of Mallein could be detected. There could be no doubt that the gelding was suffering from Glanders; the filly, however, was free. Would the Mallein have some therapeutic action in the gelding or not; if not could there be any possibility of the filly becoming infected by aerial convection of the virus if the animals were stabled in the same house permanently and close together? It was decided to keep the animals for a convenient period, such a period as might be determined in practice, say three months, and re-test at the end of that period, the animals remaining under close supervision and in the same

house, one in a loos	e box, the other	in a stall	with only the pass	sage
way between them.				

Aiter 9	 ature at Inj 9 hours.		•••		Bay Gelding.  June 23rd, 1905.  99·6° F.  99·2° F.	Black Filly.  June 23rd, 1905.  99-8° F.  98-8° F.
		•••	•••		i	
Date,	•••	•••	•••		June 23rd, 1905.	June 23rd, 1905.
Temper	ature at Inj	ection,	•••	•••	.99·6° F.	99·8° F.
Af <b>t</b> er S	9 hours.	•••	•••		99·2° F.	98·8° F.
., 1	2 "	•••			103•2° F.	100·7° F.
,, 1	6 "				10 <b>4</b> ·7° F.	100.6° F.
., 2	4 : ,,				101•8° F.	100 °0 ° F.
Local R	eaction,	•••		•••	Swelling 8"×6" increasing, Hot, painful, tender, corded lymphatics. Swelling eventually 12" ×9".	Slight swelling. Evanescent, painless.

The Mallein reaction, therefore, plainly showed that the gelding was still suffering from Glanders, whilst the filly had remained free. No curative effect had followed the free and continued use of Mallein in this case, though in the hands of numerous other experimenters the reaction to Mallein has ceased after two, three, four, or more injections given at longer intervals than in our case. Further experimenters have shown that the lesions of these animals non-reacting have healed and are non-infective when sown upon suitable media or inoculated into susceptible animals. It was decided to destroy both animals and to make a careful post-martem examination to note the condition of each.

Both animals were slaughtered on June 29th, and a post-mortem examination made immediately.

The Non-reacting Black Filly.—The animal was in fair condition. A small quantity of clear serous fluid was found in the abdominal cavity. Lymphatic glands along the colon showed here and there one to be enlarged. One contained sterile pus and remains of a nematode worm (Strongylus Armatus?). Liver, spleen, and kidneys macroscopically normal. Lungs normal; no lesions whatsoever could be found, not even worm nodules, which were fairly common in other animals from the same stud. Bronchial and mediastinal lymphatic glands also normal. Trachea and larynx normal. Schneiderian mucous membrane normal save for a flat swelling of the mucous membrane on the anterior third of the septum nasi, the mucous membrane on both sides of the septum showing the lesion at the same level. No Glanders lesion. There was aneurism of several of the branches of the anterior mesenteric artery, due to the

Strongylus Armatus—a very common lesion in horses. In this animal there was no trace of Glanders, either recent or remote, and hence the Mallein test had indicated positively the condition of the animal during life.

The Reacting Bay or Brown Golding.—The animal had steadily lost condition during its sojourn in the College, and had a typical Glanders facies, though at the time of slaughter there were no clinical symptoms of Glanders. A quantity of clear serous fluid was found in the peritoneal sac. Liver and kidneys macroscopically normal. Glanders nodule in the spleen yellowish with haemorrhagic areola. Lungs: Left lung two areas firm and haemorrhagic; old pleurisy. Calcified nodules in lung which readily shelled out. Worm nodules, about half a dozen in both lungs. Bronchial lymphatic glands juicy with greyish centres, one with caseo-purulent centre. Trachea, larynx, Schneiderian mucous membrane quite normal. Inguinal lymphatic glands somewhat indurated, with greyish centres-Glanders tubercles. Various media were inoculated with material from the lesions - potato, blood serum, glycerine agar Positive results were obtained from the lungs and bronchial lymphatic glands.

The post-martem results, therefore, confirmed the conclusions de-

General Conclusion.

rived from the Mallein testing, and in conclusion we may be permitted to generalise as follows:— Mallein is a trustworthy diagnostic agent for the discovery of Glanders:

that no tolerance to Mallein is set up in the body of an animal receiving repeated doses of Mallein at intervals of a week: that in a case of Glanders with cutaneous lesions (farcy) spontaneous recovery from infection does not occur; though the cutaneous lesion apparently heals, still the animal is glandered. In nearly all cases where recovery from Glanders has been noticed following the use of Mallein, the reacting animals were not clinically glandered, and were only recognized as infected after testing with Mallein. Our experiments also support the now generally-received opinion that Glanders infection occurs by the alimentary tract and not, as previously believed, by the respiratory passages. If the disease is spread by aerial convection the black filly had plenty of opportunity to take the infection, but she remained perfectly healthy.

#### THE FOOD OF SOME EDIBLE FISHES.

The conventional classification of the food of mankind, other than vegetable, into fish, flesh, and fowl, overlies a distinction which is not, perhaps, usually apparent.

Living tissues are subject to a continual process of waste and

### General considerations.

repair, and as long as the repair maintains a slight excess over the waste we observe the phenomenon of growth—the term denoting not only increase of size in the individual,

but also increase in the number of individuals by reproduction. For repair of the tissues, a continual access of material is required—in other words, food. Here we light upon a fundamental distinction between animal and vegetable, fundamental, at least, so far as our present knowledge goes. The animal requires organic food—food which has already been built up from primary forms of matter into living substance: the plant derives its nourishment from inorganic substances, minerals and gases which it takes from the soil and air, or from solution in water, and digests, as it were, with the assistance of sunlight.

Plants thus form the first link in the chain of life, and connect it to the mass of non-living matter of which the earth is composed. Next come those animals which feed on plants, and finally those which in their unregenerate condition feed on the bodies of other animals.

The "flesh" of human food is derived entirely, we may say,
from plant-eating animals; carnivora we do

Classification of human not eat—at least, not intentionally. The
flesh foods. "fowl" are creatures of mixed diet, the
majority feeding almost altogether on vegetable substances, a few species being largely insectivorous; birds
of prey, eaters of fish or carrion, do not form part of the normal
food of mankind.

Fish, on the contrary, feed almost entirely upon other animals. Of the many species habitually eaten, and of the many more to whom our ignorance or prejudice secures immunity, not more than half a dozen may be considered even partial vegetarians. Of the crustaceans and molluscs classified generally as "shellfish," the former are, as a rule, carnivorous, while most of the latter subsist on vegetable diet in one form or another.

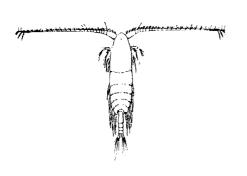
With the daily lives of land animals, birds and beasts, which inhabit the same medium and share to some extent the same environment as ourselves, most of us are tolerably familiar. To the element inhabited by the fishes, however, nature has granted us only temporary and partial access: very early in our lives we lose the last surviving vestiges of the breathing apparatus inherited from our remote marine ancestors. Mankind at large, therefore, is acquainted with the story of life in the waters only at second-hand, and that but partially. Even to the naturalist who makes it his special study, the laborious collection of observations and experiments gives only a more or less incomplete knowledge of the lives of some few species, while of many little more than the mere existence is known. We shall, therefore, for the present, confine ourselves to discussing the food of a few typical species.

From the point of view of their feeding habits, fishes may be roughly divided into two groups, those which live habitually at the surface or in midwater, feeding on floating and swimming organisms, and those which seek their food chiefly on the bottom.

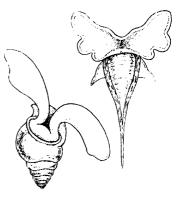
To the former group belong the migratory fishes, such as mackerel, herring, salmon and white trout; to the latter the flat fishes: plaice, sole, flounder, and others, and such round fish as cod and haddock. Intermediate between the two are fresh-water fishes, such as brown trout, carp, etc., and many sea fishes. Some of the latter in their youth are bottom feeders, but later in life develop powerful teeth and take to a cannibalistic diet, as, for example, the coalfish. The food of every fish may vary largely with changes of season or locality, according to the existence in quantity of any organism for which it may have a preference.

We may take the mackerel as a type of the surface-feeding group.

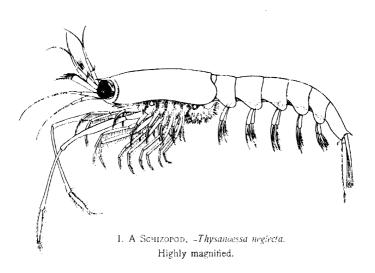
When the so-called "spring" mackerel approach the coast in April and May with a view to spawning, while still in deep water they are found to be feeding chiefly on schizopods, actively-swimming diminutive prawn-like creatures, an inch or so in length. The species particularly favoured are Thysanossa neglecta (Fig. 1) and Boreophausia inermis. Of these species the latter ranges normally from the surface to about 50 fathoms deep, the former visits even greater depths.

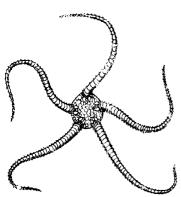


2. A Coperod,—Catanus finmarchicus. Highly magnified.



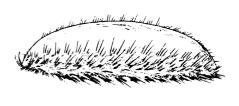
3. Pteropods, "Spirialis & Hyalea. Highly magnified.





4 A BRITTLE STAR,—Ophiura.

1 natural size.



5. A Worm,—Aphrodite.

natural size.

As the mackerel continue to approach the coast, in the beginning of May, their diet becomes more varied, consisting of various schizopods, copepods, pteropods, and other swimming and floating organisms. The copepods are minute transparent crustaceans, of which the largest rarely exceed a quarter of an inch in length. They dart about the water in countless swarms, thicker than midges in the sunshine, propelled by the little paddle-like feet from which they derive their name. Their shape and structure and their complicated arrangements of bristles and feathers are of infinite variety; many of them possess luminous organs which contribute to the "phosphorescence" of the sea; perhaps the commonest species on our fishing grounds is Calanus finmarchicus (Fig. 2).

When feeding, the fish swims rapidly with its mouth open, so that a current of water is driven outwards through its gills, the filaments of which intercept the copepods and other small organisms.

The pteropods are little molluscs, their bodies contained in delicate shells, and the foot, upon which their relations, the snails and periwinkles, walk being converted into a pair of "wings," with which they jerk themselves vigorously along. Spirialis (Fig. 3), whose body is about as big as a grain of number six shot, is common in the stomachs of mackerel at this period of the year.

As the summer advances, in June as a rule, shoals of small fish become numerous in the coastal waters, and the mackerel takes to a fish diet consisting largely of the rockling known as the "mackerel midge," but including also young sprats, sand-eels, and other fishes as opportunity occurs. The shoals of large mackerel disappear about July, and when their place is taken by the smaller "harvest" fish the latter are found to be feeding chiefly on copepeds, and continue so throughout the winter.

The shape of the mackerel, its sharp snout, smooth, tapering body and powerful tail, naturally suggest an adaptation to the capture of living and active prey. As typical of popular misconceptions in regard to such matters may be cited the evidence given (by a medical man) at a recent inquest in England, that the mackerel was a foul-feeding fish, and particularly liable to become poisonous.

Small crustaceans, chiefly schizopods and copepods, and the young of other fishes may be taken as the staple diet of all those which feed at the surface or in mid-water. The bottom-feeders add to these molluscs of several kinds, worms, star-fish, and other animals.

The cod, whose "beard" is a sensitive "feeler" of assistance to him in seeking food, has a varied menu. Crustaceans, perhaps, head the list, includ-Bottom-feeding fishes. ing crabs, shrimps, prawns, and their con-

geners; next come fish, chiefly bottomhaunting species, such as sand-eels, gobies, pogges, and flat-fish; molluscs are represented by whelks, scallops, razor-shells, and members of the cuttle-fish family; lug-worms and brittle stars (Fig. 4) are not despised on occasion.

The haddock appears to be more general in its tastes. Marine worms, usually too thoroughly masticated to be recognisable, and brittle stars are commonly found in its stomach; it takes toll of all bottom-living groups of crustaceans and of many families of molluscs; fishes, however, mostly escape.

Flat-fish display many structural adaptations relating to their feeding habits, which, however, space does not permit us to discuss at present. The furry filaments and large nostril on the blind side of a sole's head are familiar examples. The plaice's bill of fare may be taken as a specimen: though it should be observed that flat-fish in general, and, indeed, all bottom feeders, are rather suspected of taking whatever they can get in the way of food. Many kinds of marine worms, lugs, hairy-baits, scale-backs, and the beautifully iridescent "sea-mouse," Aphrodite (Fig. 5), accompany such molluscs as razor-shells and lady cockles into the plaice's maw; brittle stars are highly appreciated; crabs, hermit-crabs, shrimps and their relations, sand-eels and other fish are of less consideration.

The physical conditions of life in the sea differ considerably from those prevailing in fresh water. The annual range of temperature varies with local cir-Fresh-water fishes. cumstances of depth and currents, but, speaking generally, the bottom temperature

of the open sea has a range equal to about a tenth of that in rivers and shallow lakes.

Several of the principal orders of invertebrate animals which contribute to the food of sea fish are wholly absent from or but poorly represented in fresh water, and their place is taken by insects.

The brown trout feeds almost altogether on insects and their larvae. Where certain kinds of water-snails are plentiful the trout will eat them; one race of trout, the Gillaroo, has a specially developed shell-crushing apparatus of the nature of a gizzard. When invertebrate food is scarce, old trout will readily become cannibals. Among "coarse" fish, the predatory habits of the pike are well known. The perch is, in its youth, a fish of peace, feeding on insect larvae and crustaceans; later in life, pressure of hunger may drive it to attack other fish. Carp and others will, in times of scarcity, descend even to chewing plants.

A brief mention may be made of the food of "shell-fish." sters and crabs are carnivorous. pedestrians, afflicted with delicate eyes, they "Shell-fish." seem somewhat at a disadvantage in the race of life. The lobster, however, has a keen sense of smell, and his long "feelers" are very sensitive organs of touch. wait by day in some dark hole, he is ready to use his large claw as a bludgeon on any passer-by. At night he sallies forth, walking delicately on tip-toe, his claws advanced and the paddles of his broad tail extended ready to drive him suddenly backwards out of danger. His food consists principally of fish, living or dead, other crustaceans, molluscs which he digs up and crushes with his claws, and an occasional starfish. Dead food he prefers fresh-a delicacy of taste with which his relative the crab is not usually credited. "Dressed crab" is not necessarily poisonous; the incautious dressing of the half-digested garbage in the crab's stomach along with its flesh, is, however, attended with some risk.

Oysters and other molluscs feed on minute plants called diatoms, which they collect by straining water through their "beards," much in the same way as a mackerel catches copepods.

# FLAX-GROWING METHODS IN SOME CONTINENTAL DISTRICTS.

A deputation of Irish farmers visited some of the flax-growing districts on the Continent in last July, and on the return of the deputation the members drew up the following account of the lessons learned during their visit:—

We visited the following districts:—Courtrai, Bruges, Lokeren, and Rotterdam.

The Courtrai district was visited on 11th and 12th July.

We consider it unnecessary to dwell in detail upon the marked difference in the Courtrai methods as compared with those practised in Ireland, as we believe it is generally agreed that the

methods which have been adopted in this district could not profitably be established in Ireland. We cannot, however, refrain from remarking upon the extreme care which is used in the handling of the flax throughout all the different processes. We are aware that this has already been pointed out by previous deputations, but we believe the importance of the matter cannot be too often or too strongly emphasised.

We might also refer to the thorough ventilation which was in operation in all the mills which we visited, and which is so often absent from Irish mills.

We examined the steeping and drying operations in the Lys. We need hardly point out that since the flax is rippled and cleared from weeds before steeping, the subsequent handling is made less laborious.

As is generally known, the best flax in this district is rippled and dried, and afterwards stacked until the following year, before being steeped. The seed saved in this district is, so far as we are informed, used only for crushing and feeding purposes. As regards the value of the seed, we were informed that the return from the seed usually covers the cost of the green handling of the flax.

It is, perhaps, unnecessary to describe the method of preparing the soil for the flax crop, as it can be readily seen that the Belgian soil is entirely different from that of Ireland. We would, however, emphasise the importance which is attached to the application of liquid manures; in all cases a very liberal application is given to the crop grown previous to flax, and the ground for the flax crop almost invariably gets a liberal application a few days before the sowing of the seed.

The land in this district is in continuous cultivation, there being almost an entire absence of pastures.

The "Blue District" is, perhaps, the most interesting district in Belgium for Irish flax growers. We first visited Bruges,

The "Blue District" and believe the soil in this district is generally heavier than in Ireland. The farms, as a rule, are large, ranging from 40 to 230

acres, and there is a large proportion of permanent grass lands, or what is locally known as prairie.

The flax is pulled and handled as in Ireland, the most striking feature being the great care with which the crop is handled. We noted that the sheaves in almost all cases are bound with rye straw. The usual rotation is an eight years' course, as follows:—(1) barley, (2) flax, (3) wheat, (4) oats, (5) beans, (6) potatoes, (7) rye or wheat, (8) wheat or rye. The ground for barley and flax gets a liberal dressing of liquid manure, and that for wheat and oats is treated with solid manures. Almost all the crops get a dressing of manure of some kind.

We next visited Lokeren. The farms in the district are very small, ranging, as a rule, from two to fifteen acres, the labour in almost all cases being done by the farmer and his family. The land in this district is generally well manured. Natural manures are applied to the soil in September or October. As in the Bruges district, the soil receives a dressing of liquid manure a few days before the sowing of the flax seed. The rotation usually adopted in this district is also an eight years' course:—(1) potatoes, (2) barley, (3) flax, (4) rye, (5) oats, (6) clover, (7) rye or barley, (8) barley or rye.

The flax is usually sown from 15th March to 15th April, and is pulled during July. We were informed that Riga seed is generally used.

The flax is carefully pulled and placed in small handfuls on the ground, and these are "lapped" and tied in bundles of the size usual in Ireland. The bundles are then carted to a shed to be rippled. After rippling the flax is tied in bundles one third the size of the original ones; the bundles of flax are then placed in rows, lightly packed, in the retting ponds, with the tops of one row covering the binding of the previous row.

The whole is covered to a depth of 3 to 4 inches with mud taken from the bottom of the pit. There are no stones or sods used as in Ireland. In this district also it is calculated that the return from seed covers the cost of the green handling of the flax.

As regards labour, the conditions would appear to be much more favourable to the Belgian farmer than to the Irish. The hours are longer, and labour, being more plentiful, is, in our opinion, cheaper.

The flax is scutched at home by the members of the family, hand-mills being in general use.

The following remarks apply generally to the flax crop throughout Belgium:—

- 1. Flax is generally rippled, and the following would appear to be the advantages of this system:—(a) the seed covers cost of green handling, (b) the process opens and cleans the straw, and makes the subsequent handling much more easy.
- 2. Flax is steeped until much softer than is usual in Ireland. In order to judge the retting of the flax similar tests to those in use at home are applied.
- 3. After removing the flax from the retting pond it is washed and placed on end on the edge of the pond, in order to drain.
- 4. The flax is spread thicker than is done in Ireland. The rows are further apart, and in order to secure a uniform colour the flax is turned by means of a pole, particularly after rain.
- 5. It is usual to sow clover or carrot seeds along with flax at the time of the sowing of the flax.
- 6. The Belgian farmers practise the most careful and persistent weeding of all crops. We would urge the importance of this practice to Irish farmers.

We regret that as the season was rather later than usual, our visit to this district was too early to enable us to see anything of the handling of flax, or the actual quality of the seed.

We were aware that most of the Dutch seed sown in Ireland is obtained from this district, and we consequently devoted particular attention to the seed question. We find that the crop is allowed to ripen better than in other districts. It is pulled and rippled in the ordinary way. The seed is then cleaned, the best

being kept for sowing and the remainder used for feeding purposes. We are informed that the greater part of the seed sown in Holland is imported from Riga. We were told that as a rule good, well-grown Dutch seed, the produce of seed imported from Riga, or as it is described, Riga Child, is generally most suitable for Ireland. In some years, however, difficulty is experienced in obtaining good seed from Riga, and the Riga Child seed produced from poor Riga seed is not good.

In such cases Dutch Riga Child seed, the produce of seed imported two years previously from Russia and grown two years in Holland, may be good and suitable for Ireland. In passing through the country we observed that the crop in general appeared short and not of good quality.

We cannot too strongly emphasise how important it is that Irish flax growers should secure seed of a good quality, and to do this we were assured on all hands that it is absolutely necessary for farmers to place their orders early—if possible before the end of the year—also to provide that the seed be obtained only directly from reliable firms.

We would like to take this opportunity of stating how sensible we are of the value of the information obtained during our visit, and we are convinced that the result of our journey will be of great value not only to ourselves but to the farmers with whom we come in contact in our various districts.

We are of opinion that if proper care is used in the handling of the flax, and provided that proper marketing facilities exist, the Irish flax grower is, on the whole, in a position equal to, if not better than, the Belgian or Dutch grower.

We would respectfully recommend that the Department should place proper rippling machines in the hands of a number of intelligent growers, in order that experiments may be carried out in the various flax-growing districts in Ireland, as it would appear that rippling would be a source of profit to the Irish grower.\*

In concluding this report we most expressly desire to record our thanks to the several gentlemen in Belgium and Holland who so unselfishly and unreservedly placed their services and know-

<sup>\*</sup> NOTE—The Department carried out experiments on the rippling of green straw in Ireland in 1903, 1903, 1904, and 1905. The results of the trials conducted in 1903, 1903, and 1904, have already been published in the Department's Journal, and in leaflet form. The returns from the experiments in 1905 are not yet available.

ledge at our disposal, also for the trouble they took in explaining and having explained in detail everything in connection with the industry which might be instructive or useful to the deputation.

ROBT. MOORE, Newtownstewart, Co. Tyrone.

WILLIAM J. STEWART, J.P., Castlefinn.

WM. HENRY FAUSSETT, Mount Glen, Co. Mayo.

HUGH CARVILL, J.P., Castleblayney, Co. Monaghan.

BEN HENRY, Dunboe Flax Society, Co. Derry.

JNO. M'COMBRIDGE, Glens of Antrim Flax Society.

GEORGE W. KNIGHT, Donagh House, Lisnaskea.

ROBERT WYLIE, Letterkenny Flax Society, Co. Donegal.

EDWARD GALLEN, Urney Co-operative Flax Society (Ltd.).

JAMES C. ADAMS, I.A.O.S., Dublin.

# THE FLAX AND HEMP HAND-SPINNING INDUSTRIES IN SOME CONTINENTAL COUNTRIES.

In the first issue of this Journal (Vol. I., No. 1, August, 1900), it was announced that the Department intended to make an inquiry into the whole subject of the Flax industry, and that articles and reports, bearing both on the practical and scientific side of the industry, would be published from time to time in the Journal. Accordingly, many articles dealing with the Flax and Linen industry have been published in this manner, notably, "The Flax Industry of Ireland" (Vol. I., No. 1, p. 43.) "An Historical Sketch of the Flax-Growing Industry in Ireland" (Vol. III., No. 4, p. 687), "Flax-Seed for Sowing Purposes" (Vol. IV., No. 2, p. 269), and "The Linen Trade and its Raw Material" (Vol. V., No. 4, p. 630). Full accounts have also been given of the results of the Department's Annual Flax Experiments. As queries have been addressed to the Department, from time to time, regarding the condition of the flax and hemp hand-spinning industries in Continental countries, and as the matter is of some general interest, the Department decided to enquire into the matter. Such an inquiry would have been very difficult to carry out were it not that the Foreign Office courteously undertook to obtain the information required. As a result, the particulars given below, showing the position of the hand-spinning industry in certain Continental countries, have been obtained. The points upon which information was sought may be summarised as follows:-

- 1. In what districts of each country, and to what extent, is the spinning of flax by hand-wheels carried on?
- 2. To what numbers of yarn is the material spun, and into what kind of cloth is it woven?
- 3. How far is the product intended for commercial purposes, and how far for domestic use only?

The results of the inquiry are set forth in detail below:—

The spinning of flax and weaving of linen stuffs as "kustarni," or cottage industries, are carried on in Russia.

Russia. almost every part of Russia. The products, however, are mainly for the peasants' personal use. Only in the manufacturing regions, and more parti-

cularly in the governments or provinces of Yaroslav and Kostroma,

are these industries carried on with a view to sale, i.e., for commercial purposes. The peasants employ, to this end, yarns bought from neighbouring textile mills, which have established special distributing offices in the locality. The peasants find this a cheaper method than spinning the flax themselves.

The value of the flax products annually turned out by Russian "kustarni," or cottage industries, is estimated at about 50,000,000 roubles, of which 30,000,000 roubles constitute the profit of the peasant workers. Weaving takes place either in the cottage itself, or in special premises called "svietelkas," or small co-operative workshops, of rough wooden make. The instruments are mostly of the most primitive description, though of late more finished spinning wheels, Jacquard looms and others, are being utilised in some districts.

The yarn bought from the mills is usually of low numbers, though at times up to No. 56. It is woven into coarse linen stuffs for the peasants' personal wear and for soldiers' wear, also into "criasht," or coarse packing cloth (some of which is exported to America), and into "deriuga," another sort of sack, or packing cloth.

In Austria hand-spinning is still carried on to a small extent in Silesia, Moravia, Tyrol, Bohemia, Upper Austria-Hungary. and Lower Austria, Carinthia, and probably also in Styria.

It is impossible to say to what numbers the yarn is generally spun, as there are no data available, owing to the purely domestic character of the industry. It is as a rule only used to make linen for domestic use.

The product is not intended for commercial purposes at all, with the exception of some coarse yarn (about Nos. 3 to 6), spun out of flax waste, which is made into rough cloth in poor districts in the Bohemian and Moravian mountains, and sold by pedlars.

The spinning of flax by hand-wheels is still carried on, to a considerable extent, in Hungary in the following counties: Bacs-Bodrog, Haromszek, Csik, Nagy-Kukullo, Kis-Kukullo, Zala, Vas, Komaron, Abauj, Bereg, and Ung.

The material is spun in one single yarn.

In addition to the common linen and common woven cloth spun in all parts of Hungary "jacquard" and "damasc" wares are also produced in the county of Bacs-Bodrog.

In the counties of Haromszek, Csik, and Kis-Kukullo, the linen is woven half of flax and half of coloured cotton.

The linen and common woven cloths are destined entirely for domestic use, the better sort of cloths being sold at the neighbouring markets.

"House industry" establishments with regular commercial organisation exist in the counties of Arva, Lipto, Bereg, and Haromszek, and the products are, for the greater part, sold in answer to the demands from public institutions.

The number of hand-looms used at these establishments is about 1,400, but, besides the production of flax fabrics, these hand-looms are also used for producing hemp and cotton wares.

The spinning of flax by hand still goes on in the North of
Portugal, chiefly in the Minho Province, but
to a diminishing extent. The spinning is
mostly done (by old women) with a distaff,
wheels being now very rarely used.

It is not possible to get any statistics, because for the most part the industry is a domestic one, and the cloth manufactured is intended chiefly for the use of the family of the farmer who grew the flax. The cloth manufactured is of various qualities, from the coarse and greyish material used by the poorer classes, to the very fine and beautifully white sheets and towels to be seen in the houses of well-to-do farmers in the Minho district. It is not possible to give the numbers of the yarn. There is no standard, and as it is all spun by hand it is not very regular. It is not uncommon to observe four or five counts in the same skein spun by the same woman. The cause of the decrease in flax growing is partly attributable to the use of linen going out of fashion, and partly to the cheapening of the grey cloth manufactured in the numerous cotton mills in the country. This is observable in country inns in the North of Portugal, where formerly the beds invariably had linen sheets and pillow cases, but this has become comparatively rare, and cotton is now used.

There is no doubt that some farmers still continue to grow flax for their own consumption, in many cases owing to the natural satisfaction and pride they feel in obtaining not only food, but also clothes out of the land which is theirs. At Guimaraes, Braga and Penafiel there exists an industry in hand-made linen for sale, but it is on the decline.

At Guimaraes there is now a steam linen mill, but the goods manufactured can only be for consumption in the country, as will be seen from the insignificant quantities exported.

EXPORTS OF LINEN GOODS.

V	In t	he Piece.	Manufactured.		
Years.	Kilos.	Values.	Kilos.	Values.	
		\$		\$	
1901,	1,246	400	2,968	2,600	
1902,	3,433	2,000	<b>2,76</b> 0	2,200	
1903,	4,883	1,100	993	900	
1904,	2,168	400	1,500	800	

The Flax and Hemp Hand-spinning Industries in Norway are Norway and Sweden. so very insignificant as to be practically nonexistent.

It is principally in Northern Sweden that Flax is spun by hand, and chiefly in the Province of Gesleborg, and in the parish of Asbra, where this is a common household occupation.

The flax is spun to the finest as well as the coarsest warp and woof for the purpose of making table linen and blankets. According to official statistics for the year 1903 (the latest available), the production, including both fabrication by hand and by machinery, was as follows:—

FLAX AND HAND SPINNING MILLS.

DE	And an an an individual		Number of Factories.	Workmen.	Kroner.
ricts,			1	106	362,800
••			2	279	1,238,599
,,	•••		1	95	2,227,500
Gesleborg "				80	278,000
	ricts,	ricts,	ricts,	of Factories.  ricts, 1 2 1	of Factories. Workmen.  ricts, 1 106 2 279 1 96

LINEN AND HEMP WEAVING FACTORIES.

PROVINCE.	Number of Factories.	Workmen.	Kroner.
Halland Country Districts,	 1	87	5 <b>03,48</b> 5
Goteborg and Bohns "	 2	433	1,229,552
Alfsborg Town of Boras,	 1	_	31,772
" Country Districts,	 5	175	617,207
Skaraborg "	 1	66	175,000
Gefleborg Town of Hudiksvall,	 1	20	7,360

Export of Flax and Hemp Yarns, simple, undyed, and unbleached: Kilogrammes, 414; Kroner, 704.

Export of Flax and Hempen Tissues of all kinds: Kilogrammes, 7,172; Kroner, 28,688.

The spinning of flax by hand-wheel has practically ceased in Denmark, and only in some very few farms, especially in the island of Funen, is it still carried on. About half a century ago there were spinning hand-wheels in use in almost all farms and country

were spinning hand-wheels in use in almost all farms and country houses all over Denmark, but since the development in the production of agricultural produce and the growth of the co-operative movement, the home spinning industry has dwindled down, and is now quite insignificant. At the same time the growing of flax in Denmark has also been abandoned.

The numbers of yarn to which the material is spun are only very low, and it is only woven into linen.

The material has, even in former times, only been intended for domestic use.

At present linen of a superior quality, table linen, pockethandkerchiefs, etc., are imported from Great Britain and Ireland, while other linen goods come from Silesia and Saxony.

It appears that this industry is practically extinct in France, although a few old women may still be seen in cottages in Anjou and Brittany spinning coarse yarn for domestic use.

The flax and hemp hand-spinning industry has entirely disappeared from the Department of the Nord. One may meet occasionally, here and there, an old woman, who has kept up this ancient

industry, but she would pass as a curiosity. As a matter of fact, hand spinning has been completely superseded by machinery.

The spinning of flax by hand has been abandoned in Belgium,
the last hand-wheels having disappeared two
Belgium. or three years ago. The threads produced
were of rather a common quality, and were
used in the manufacture of hand-spun cloth. Hemp is still spunby hand for rope-making, and to a limited extent for sack-cloth
making. The seat of the industry is in West Flanders, notably at
Termond, Hamme, Zele and Lokeren. About 1,700 hands are employed. Manufactories in other places of the country employ some
650 hands.

Particulars as to the yarn spun are wanting. Belgium does not produce more than 500,000 to 600,000 kilogrammes of tow per year. The rope-making industry produces some 10 million kilogrammes of rope, roping, cables, etc., of which some two millions are made by hand.

Very little of the product appears to be intended for commercial purposes; the quantity of hemp thread for making sack-cloth does not exceed 100,000 or 150,000 kilogrammes a year.

Hand-spinning has almost entirely disappeared in Prussia, though
it formerly existed to some extent in
Germany. Silesia. Spinning by hand-wheels hardly
exists anywhere in Northern Bavaria except

n Mucachherg in Upper Franconia, but a few farmers have a

in Muenchberg, in Upper Franconia, but a few farmers have a small quantity of flax spun by hand-wheels during the winter, and it is then made into home-spun coarse linen for domestic purposes.

A firm of spinners in Muenchberg says that the material is spun to Nos. 6 to 20 of yarn, and that about 3,000 spindles are at work from December to March.

The flax produced in Bavaria (confined to the northern part of the Upper Palatinate, the Fichtel Mountains, Upper Franconia, Bavarian Forest (Bayerischer Wald) in Lower Bavaria, the mountainous districts of Upper Bavaria and Swabia) is rarely used for spinning, and is devoted almost exclusively to the manufacture of household linen for the use of the farmers themselves. The linen thus manufactured does not form an article of commerce to any material extent.

In Wurtemburg the flax and hemp hand-spinning industry has steadily decreased during the last twenty years, and may be

almost described as non-existent. The small remnant of a once flourishing industry is now entirely confined to a few scattered homesteads in the Black Forest district and in the Swabian Alp, and is only pursued during the winter months when there is little or no work possible in the open. In both districts the best evidence of how rare hand-spinning has become is the extremely small area in which flax or hemp is cultivated by the peasants.

Hand-spun thread is only of the coarsest description, and runs in the yarn from No. 8 to No. 16, and is woven into a very coarse but serviceable cloth.

All the hand-spun and woven product is for domestic use, and none is manufactured for commercial purposes to compete with the machine-spun and hand or machine-woven cloth.

These industries are carried on to a very small extent in Servia,

chiefly at Leskovatz and Vranja, and in a very primitive manner.

The product is intended almost entirely for domestic use, but occasionally a small amount of yarn passes the frontier into Turkey and Bulgaria. The coarse cloth which is woven from it is wholly for home consumption.

The following table gives particulars of the present position of the Spain. hand-spinning industry in Spain:—

»Pain		nand-spinning materity in Spain :									
			Number of Looms.								
District	•	ند	Simple Looms with Hand Shuttles.	Looms for Sackeloth, Sacking, and Packing Cloths.	Rope and Cable Factories.	Hemp and Card Factories.					
Alicante, .			12	72	ad have	14					
Badajos, .			22	65							
Barcelona,			228	166	4	25					
Burgos, .			8	86		5					
Castellon, .		.	7	68							
Cordoba, .				46		14					
Coruna, .			39	42							
Cuenea, .				47							
Grenada, .	•	.		85		3					
Guadalajara				63		-					
Hueses, .		.	1	170		2					
Salamanca,		.	1	46		1					
Soria, .			9	101							
Valencia, .			20	155							
Valladolid,		.	21	69		10					
Zamora, .	•		56	73							
Zaragoza, .			66	265		72					
Other districts,			159	376	1	78					

# VARIETIES OF FRUIT SUITABLE FOR CULTIVATION IN IRELAND.

The following list of varieties of fruits has been prepared for the guidance of farmers and cottagers, and in bringing it under their notice the Department take the opportunity of once again urging upon every person who owns land the desirability of devoting portion of the land to fruit growing. The extensive enquiries which the Department have made during the last few years have shown that fruit, particularly apples, of excellent quality can be grown in Ireland. The value of fruit as an article of diet is not sufficiently recognised; for home consumption any kind of fruit which will suit the soil and situation should be grown.

Regarding the cultivation of fruit for sale, the apple can be recommended with the greatest confidence, provided the management is good and that care is taken in grading and packing the fruit for market. A leaflet (No. 55) dealing with the cultivation of apples has been issued by the Department, and copies can be obtained, free of charge, on application.

Those who intend to plant should prepare their land and order trees early, as owing to the great demand, arising chiefly from the Department's scheme of instruction in horticulture, it will be difficult to get first class trees late in the season. Farmers are warned against purchasing trees which are badly formed or otherwise defective; they should insist upon having the best. In the counties where instructors in horticulture have been appointed by County Committees of Agriculture and Technical Instruction it is competent for the County Committee to purchase trees in bulk and resell them at cost price to farmers.

The notes printed below refer to the numerous varieties of fruits that can be grown in Ireland. No kind has been included that does not possess some special merit. All the varieties mentioned are not, however, suited for general use; those specially recommended are marked thus \*.

## DESSERT APPLES.

\*1. Allington Pippin.—A popular variety; fruit of moderate flavour; it is a healthy grower on either Paradise or crab stock, and makes a beautiful pyramid-shaped tree.

Season.—November to January.

- 2. AMERICAN MOTHER.—An excellent variety; attractive in appearance and of fair quality; a good cropper and hardy.

  Season.—October.
- \*3. Beauty of Bath.—The best early dessert variety, and one of the best market kinds; flesh firm, colour bright and attractive, quality excellent; does well on Paradise stock.

  A hardy variety, which should be extensively planted.

  Season.—August.
- \*4. Blenheim Pippin.—An excellent variety; fruit of good quality, and suitable for both cooking and dessert; requires strong soil, and does not bear till well established.

  Season.—November to February.
  - 5. Charles Ross.—A highly-coloured variety, with large fruit of medium quality.

    Season.—November.
  - 6. CLAYGATE PEARMAIN.—A good late variety for private use; not suitable for market.

Season.—January and February.

\*7. Cox's Orange Pippin.—The best late dessert variety; to get the best results it should be grown entirely on Paradise stock, and where found to succeed it should be planted extensively.

Season.—November to March.

8. Devonshire Quarrenden.—An old variety, now largely superseded by Worcester Pearmain; a very free bearer, but liable to "spot" if grown in a damp situation.

Season.—September.

\*9.—Gascovne's Scarlet Seedling, or Glory of England.—
A highly-coloured variety, suitable both for cooking and dessert; a strong grower on either Paradise or crab stock; well suited for market purposes.

Season.-November and December.

10. James Grieve.—A heavy cropping variety of recent introduction; the fruit has a fine flavour, but is soft and easily damaged, and thus requires careful packing; should be grown chiefly as a bush on Paradise stock.

Season.—October and November.

11. King of Pippins.—A variety which requires high-class culture to grow properly; there is a tendency for the fruit to set very thickly, and to procure apples of good size this necessitates thinning; the fruit is deficient in flavour, and in some soils is liable to "spot"; generally does much better in the South than in the North of Ireland.

Season.-November and December.

\*12. Lady Sudeley.—One of the handsomest of our large early dessert apples; fine flavour and quality; does best on Paradise stock; inclined to canker on crab stock when planted in cold and undrained soil.

Season.—September.

- 13. Red Winter Reinette (Baumann's).—A highly-coloured variety of good quality; moderate cropper; keeps well.

  Season.—December and January.
- 14. RIBSTON PIPPIN.—An old variety, which requires high-class cultivation; very liable to canker, and not recommended for general planting.

Season .- November to March.

15. Russetts.—These are of various kinds and qualities, are mostly well flavoured, and very hardy; more suitable for private use than for market.

Season.—November to May.

\*16. Worcester Pearmain.—A very handsome and popular market variety; a great cropper and a healthy growing tree; succeeds well on either crab or Paradise stock, but higher class fruit is produced on the latter.

Season.—September and October.

## COOKING APPLES.

17. Alfriston.—An old and useful late-keeping variety; liable to canker in the North of Ireland, but does well on warm soils; fruit large.

Season.—December to May.

18. Beauty of Kent.—A late variety, suitable for both cooking and dessert; a good orchard tree, but produces much finer fruit when grown on Paradise stock.

Season.—November to January.

19. Belle de Pontoise.—A valuable late-keeping variety; free bearer and of good quality.

Season.—December to April.

20. Bielo Borodawka.—An early variety of recent introduction; very free bearer and of good quality.

Season.—September.

\*21. BISMARCK.—An improved Cox's Pomona, an enormous cropper, and a good market variety; slightly inclined to canker on cold, damp soils.

Season.—October and November.

- \*22. Bramley's Seedling.—The most reliable of the late varieties; a strong healthy tree; very prolific, but not profitable until well established; an excellent market variety.

  Season.—December to April.
  - 23. Cox's Pomona.—A cooking variety with fair dessert qualities; though now largely superseded by Bismarck it is well worth growing; a heavy cropper.

Season.—October and November.

24. Domino.—A good early variety; a free bearer and suitable for market purposes.

Season-August and September.

\*25. Duchess of Oldenburgh.—One of the freest bearing early kitchen varieties; too soft in the flesh for market purposes, but should be grown in all private gardens.

Season.—August and September.

\*26. EARLY VICTORIA.—The best early market variety; immense cropper; good on either Paradise or crab stock; strong and vigorous and succeeds in most situations.

Season.—August and September.

\*27. Ecklinville Seedling.—A splendid market variety; the fruit is large but easily damaged, and therefore requires careful packing; does best on a fairly strong soil, and is liable to canker if the soil is unsuitable.

Season.—September and October.

28. EMPEROR ALEXANDER.—An exhibition variety, unsuitable for market purposes; not a good bearer; is inclined to "spot"; does best on Paradise stock in a warm sheltered situation.

Season.-October and November.

29. Golden Noble.—A variety well suited for all purposes; good cropper and hardy.

Season.—November and December.

30. Golden Spire.—A heavy cropper and a suitable variety for home consumption; the fruit is not large.

Season.—October to December.

\*31. Grenadier.—One of the most reliable early varieties for orchard purposes; of healthy and vigorous growth; well suited for market purposes.

Season.—September and October.

32. Hambling's Seedling.—A very prolific late variety; suitable for orchard purposes; the tree is of vigorous, healthy growth, but is not profitable until well established.

Season.—December to March.

33. LADY HENNIKER.—A good keeping variety; the fruit is excellent for cooking, but owing to its shape is unsuitable for market purposes.

Season.—October to February.

\*34. Lane's Prince Albert.—One of the best varieties for small gardens; an immense cropper, good keeper, and very handsome; is inclined to canker on grass or cold soil; does best as a bush-shaped tree.

Season.—December to April.

\*35. Lord Derby.—A most reliable and popular mid-season variety; tree very vigorous and healthy; does best on cultivated soil.

Season.—October to January.

\*36. Lord Grosvenor.—One of the best and most popular early cooking varieties; a heavy cropper, so that thinning is often necessary to procure fruit of good size.

Season.—August and September.

37. Loddington (Stone's).—A heavy and regular cropper, producing large even-sized fruit; well suited for market purposes.

Season.—October and November.

38. MARTIN'S SEEDLING (No SURRENDER).—A variety suitable for both cooking and dessert; a free, healthy grower; suits well for grafting on old trees.

Season.—September and October.

\*39. Newton Wonder.—An excellent late-keeping variety; grows well in the orchard, or makes a nice pyramid for the garden; valuable for marketing purposes late in the season.

Season .-- December to May.

40. Peasgoon's Nonsuch.—A remarkably handsome variety, and indispensable for exhibition purposes; in most districts it is an uncertain cropper, and on some soils it is very liable to canker; the tree is a vigorous grower and needs careful pruning.

Season.—October to December.

41. Potts' Seedling.—An early variety; in some districts very liable to canker.

Season.—September and October.

42. ROYAL JUBILEE.—A fair cropper, and a healthy, vigorous grower; blossoms late, and is not liable to damage by spring frosts.

Season .-- October to January.

43. Sandringham.—An excellent variety; free grower, good cropper and hardy; fruit attractive in appearance and keeps well.

Season .- January to March.

\*44. STIRLING CASTLE.—One of the best kinds to grow in small gardens; it is such an enormous cropper that the tree grows slowly and never attains large dimensions; does well on either the Paradise or crab stock; this variety is strongly recommended for planting.

Season .- October and November.

45. The Queen.—A healthy, strong grower; rather an uncertain cropper; the fruit is highly coloured.

Season.—October to December.

46. Tower of Glamis.—A good orchard variety; large, healthy, spreading tree; the fruit is well suited for market purposes or home consumption.

Season.—October to January.

\*47. Warner's King.—The fruit is large and excellent for cooking purposes; the tree is of vigorous growth, but liable to canker; does best on Paradise stock; as the fruit is easily blown from the tree it is not desirable to plant this variety in quantity.

Season.—October and November.

48. Wellington (Dumelow).—A late-keeping variety; is inclined to canker on cold or wet soils; the fruit is of good quality but small in size and unsuitable for market purposes.

Season.—December to April.

\*49. White Transparent.—One of the best early varieties; good cropper and of strong vigorous growth; well suited for market purposes.

Season.—August.

### PEARS.

50. Beurre D'Amanlis.—An early variety well suited for either orchard or garden; is liable to rust and canker in some districts, but where the soil is suitable, it should be extensively grown.

Season.—September and October.

\*51. DOYENNE DU COMICE.—One of the best varieties in cultivation; delicious flavour, spicy, and juicy. A fine cropper in open ground in the South, but needs a wall in the North of Ireland; should be grown extensively for market.

Season.—November and December.

\*52. EMILE D'HEVST.—An excellent variety of Marie Louise type, but hardier and a more certain cropper; does best on the quince stock.

Season .-- October and November.

53. Fertility.—A heavy cropping variety of poor quality; requires a warm season to ripen in Ireland.

Season.—September.

54. Josephine de Malines.—A late variety of good quality; a free cropper and hardy.

Season.—February to April.

55. MADAME TREVVE.—An early variety succeeding Bon Cretien; free cropper and hardy.

Season.—September.

\*56. MARIE LOUISE.—A fine dessert variety of excellent flavour; an uncertain cropper; does best on a wall, but can be grown on open ground, if the roots be kept near the surface and the soil be well drained.

Season.—October and November.

- 57. PITMASTON DUCHESS.—A variety largely grown for market purposes; the fruit is large and of medium quality; does best when grown against a wall, but good results can be obtained from pyramid trees if carefully pruned.

  Season.—September and October.
- \*58. Williams' Bon Cretien.—An early variety of excellent quality; hardy and vigorous; fruit should be gathered before becoming quite ripe.

Season.—September.

#### PLUMS.

\*59. Victoria.—The best variety for general cultivation; fruit large, red, suitable for all purposes; very free cropper, healthy, and vigorous.

Season.—August and September.

- \*60. RIVERS'S EARLY PROLIFIC.—A heavy cropping early variety; fruit medium, red; invaluable for early marketing.

  Season.—August.
- \*61. The Czar.—A very reliable variety; fruit medium, purple, abundant cropper.

Season.—August and September.

62. Monarch.—A late variety of good quality; fruit black; free bearer, healthy and vigorous; owing to late ripening this variety should not be planted in cold, damp localities.

Season.-End September.

63. Pond's Seedling.—A very large red plum of poor quality; a good bearer, and healthy grower; useful for market late in the season.

Season.—September.

64. JEFFERSON.—The best yellow plum for general cultivation.

Season.—September.

#### DAMSONS.

- 65. Bradley's King.—Fruit of excellent quality.
- 66. FARLEIGH PROLIFIC.—Very free bearer; hardy.

## MIRABELLE.

67. "CHERRY PLUM."

Varieties .- Red, Yellow.

These fruits are useful for preserving; they can be grown in poor soil, and in exposed situations, where plums will not succeed.

## GOOSEBERRIES.

- \*68. Crown Bob.—One of the most useful market varieties; fruit medium red; a very prolific bearer.
- \*69. Lancashire Lad.—Fruit rather large, nearly smooth, red; particularly well suited for market purposes; bush of compact habit.
- \*70. Winham's Industry.—The best all-round variety in existence; a very free and constant bearer; fruit large, red; can be gathered early green.
- \*71. Whitesmith.—A first-rate variety, a good companion to Winham's Industry for general cultivation; fruit large, white; can be gathered very early.
- \*72. KEEPSAKE.—A very prolific and reliable variety; second only to Winham's Industry for market purposes; fruit large, yellow.
  - 73. Langley Green.—A variety of recent introduction; berries long and large; suitable for early marketing.
  - 74. MAY DUKE.—A comparatively new variety, not yet thoroughly tested in Ireland; claimed to be the earliest variety for picking green.

## CURRANTS (RED).

- \*75. RABY CASTLE.—The most prolific bearing red currant; a strong grower; the best for market purposes; rather late ripening.
- \*76. Scotch Red (Red Champagne).—A first-rate early variety; largely grown for market purposes.
  - 77. Red Dutch.—A first-rate variety, but not always a sure cropper. (This variety is also sold under other names at higher prices.)

## CURRANTS (BLACK).

- \*78. Boskoop Giant.—The best variety of black currant, but there is some difficulty in procuring plants true to name; free bearer; vigorous grower; fruit very large.

  This kind is said to resist the attacks of the black currant mite.
- \*79. Baldwin.--A good market variety; not as strong a grower as Boskoop Giant; abundant cropper.
- \*80. VICTORIA.—A strong grower; fruit large; ripens later than most of the other varieties.
  - 81. Black Naples.—Good market variety, not a strong grower; a very prolific bearer.

Note.—Care should be exercised when purchasing black currants to obtain a guarantee that they are free from black currant mite. ("Big-Bud," "Swollen Bud.") Plants should only be bought from Irish growers, as the Irish stocks are comparatively clean. (See the Department's leaflet, No. 47—Black Currant Mite.)

## STRAWBERRIES.

- \*82. ROYAL SOVEREIGN.—The best all-round variety for general cultivation; an early kind; fruit large, bright and attractive, flavour good, flesh firm.
- \*83. GIVON'S LATE PROLIFIC.—One of the best late kinds; free and vigorous; fruit of good quality.
- \*84. FILLBASKET.—A very useful mid-season variety; free bearer; fruit of good quality.
- \*85. Monarch.—A heavy cropping variety succeeding Royal Sovereign; flesh rather soft, so the fruit should not be left too long on the plants.
  - 86. The Laxton.—A first-rate early variety with large fruit; free and vigorous.
  - 87. VICOMTESSE H. DE THURY.—One of the most useful varieties for preserving; fruit small and firm, does not break up in boiling; very free grower when obtained from a true stock.

## RASPBERRIES.

- \*88. Superlative.—This is the best raspberry in existence for market purposes, and for private use; where it will grow no other should be planted.
- \*89. Carter's Prolific.—A very good kind, hardier than Superlative.
  - 90. Yellow Antwerp.—Only useful for private use where variety is desired.

## THE GERMAN SEA FISHING INDUSTRY.

Ever since the fall of the great Hanseatic League, the German deep-sea fishing industry has been of comparatively minor importance. Of recent years, however, as Mr. Vice-Consul Oliver points out in a recent Diplomatic and Consular Report (Cd. 2683—1905), although still of moderate proportions, German deep-sea fishery continues to develop steadily in spite of various disadvantages.

The following table shows the constitution of the combined German Fishing Fleet.

German deep-sea fishing fleets during the past five years:—

	Steam.			Sailing.			Total.		
Year.	Number of Ves <b>s</b> cls.	Gross Tonnage.	Crews.	Number of Vessels.	Gross Tonnage.	Crews.	Number of Vessels.	Gross Tonnage.	Crews.
1900, . 1901, . 1902, . 1903, . 1904, .	128 130 138 159 172	18.583 18.876 20,083 21.206 28,346	1.258 1,230 1,208 1,737 1,891	436 427 404 417 451	16,469 17,420 16,774 18,869 19,514	2,537 2,593 2,478 2,797 3,148	564 557 <b>542</b> <b>576</b> 623	35,052 36,296 36,857 40,075 47,860	3,795 3,823 3,686 4,534 5,039

In 1903-04 for the North Sea fishery 13 steam trawlers, 9 steel smacks, 5 smacks with auxiliary power, 8 deep-sea smacks and 10 coasting craft were built in Germany; 1 steam trawler and 4 smacks were bought in the United Kingdom, and 11 steam trawlers and 14 smacks were building.

For the Baltic several new vessels were acquired. The Eckern-förder yard delivered 22 new smacks, of which 3 were fitted with motors. It is said that the Danish petroleum motors find especial favour with the Baltic fishermen; 12 of these vessels are in use in the Kiel district.

The past year (1904) is considered to have been on the whole satisfactory for German deep-sea and coast fishing. The total result in wet fish was £966,021, which was distributed among the fishing ports as follows:—

-	Value			
				£
Geestemunde			• }	262,151
Bremerhaven			. 1	38,433
Bremerhaven, Hamburgh and Cuxh	ave	n.		187,022
Altons.				143.076
Stattin	•	•	. }	66,474
Stettin, Other Baltic ports,	•	•	• }	268,865
Other Dates ports,	٠	•	• 1	200,000
Total,			.	966,021

These figures refer only to the fish sold by auction in open market.

The enormous fluctuation in the demand for fish in Germany is

Fluctuation of Demand for Fish.

said to seriously affect the prosperity and development of the industry. In the winter months the demand is considerable, and prices consequently rise very high; but this demand falls off to a great extent imme-

diately after Easter, and remains small throughout the summer, in consequence no doubt of the prevalent supposition that the fish will not keep in warm weather and that the ice packing cannot be relied upon. This stagnation in the summer trade is apparently unjustified, since the quality of most sea fish is considered to be rather better in summer than in winter, and the ice packing is so excellent that the fish arrive in perfect condition at destinations in the interior of Europe so remote as Switzerland and Vienna. The extent of this fluctuation may, for example, be judged in some measure from the fact that in 1903 the lowest and highest prices obtained at Geestemünde were: for North Sea haddock 1s. and £3 7s.; for Iceland haddock, 6d. and £1 16s.; and for codfish, 6d. and £1 15s. per cwt. respectively.

There is at present no question of fish becoming a staple article

Possible Increase of consumption.

of food for the masses of the inland population, but active steps are being taken to popularise the use of it. In view, however, of the present high price of meat—and under the new German tariff, which will come into

force in 1906, the price of meat may be appreciably higher—there is a strong probability that the consumption of fish will materially increase. The present duty on meat is: for fresh and frozen meat, 15s. per cwt.; for salt meat, 17s. 6d. per cwt.; for smoked meat, £1 17s. 6d. per cwt.; and for lard, 9s. 9d. per cwt.; and under the new tariff the duty will be £1 2s. 6d., £1 10s., £3 and 15s. per cwt. respectively.

On the other hand, it is thought that the duty of 7s. 6d. per cwt. imposed by the new German tariff upon imported carp will adversely affect sea-fishing, for the consequence of this measure has been that Austria-Hungary has placed a duty upon fresh fish, which was hitherto free of duty. This circumstance is regarded as exceedingly unfortunate, since the consumption of fish in Vienna has latterly increased more than 30 per cent., and, Austria-Hungary being largely a Roman Catholic country, there was every prospect of the trade developing. The duty itself is not so objectionable as

the delay occasioned by Customs manipulation, which will probably be a complete bar to further trade. As over 40 per cent. of the fish imported into Germany is British-caught fish the increase in the demand for fish in that country is of importance for the British fishing trade and industry. The following statistics will, therefore be of interest. In 1880, when the bulk of the fish consumed in Germany was fresh water fish, the consumption in Prussia per head of the population was 1.1 lb., whereas at that time it was in the United Kingdom 8:36 lbs., in France 6:82 lbs., in Denmark 4.18 lbs. and in Sweden and Norway 3.74 lbs. But in 1901 the consumption of fish in Prussia had risen to about 6 lbs. per head, and this increase is no doubt entirely due to the increase in the

Imports of Fresh Fish.

consumption of sea fish. The following table shows the amount of the imports of fresh fish into Germany from various foreign countries: ---

T			Ì	190	2.	1903.		
Imports from			Quantity.	Value.	Quantity.	Value.		
United Kingdon	n,			Cwts. 631,889	£ 445,317	Cwts. 583,035	37 <b>4</b> ,341	
Denmark,	•••	•••		267,619	296,195	287,198	316,975	
Austria-Hungar	γ,			35,278	101,434	40,276	119,219	
Notherlands,				118,163	172,634	116,501	173,122	
Sweden,	••	•••		61,266	48,390	112,141	68,244	
Russia,	•••			48,301	100,341	46,985	104,488	
Belgium,	•••	•••		47,732	66.197	51,816	54.927	
Norway,	•••	•••		159,932	83,024	179,772	83,219	
United States,	•••	•••		13,867	35,805	19,192	51,219	
Other countries	,	•••		18,719	40,585	32,450	46,780	
Total		•••		1,402,756	1,389,922	1,469,366	1,392,534	

Imports from the United Kingdom.

It appears that of the total import of fresh fish into Germany during the years 1899-1903 the comparative share supplied by the United Kingdom was as follows: ---

		1	er Cent	i,	
	1899.	1900.	1901.	1902.	1903.
Weight of fish imported from United Kingdom, Value " " "	24 16	43 23	39 28	45 32	40 27

The import of cured fish (not including herrings) was as follows

	190	2.	1903.		
Imports from—	Quantity.	Value.	Quantity.	Value.	
Netherlands, United States, Other Countries,	Cwts. 107,269 34,787 15,459	£ 279,705 90,683 40,341	Owts. 63,446 42,464 16,205	£ 110,292 147,610 38,244	
Total,	157,515	410,729	122,115	296,146	

A comparison between the following tables will illustrate the importance of the German market for British-caught herrings. Table A shows the result of the herring fishing in the countries where the industry is chiefly carried on:—

TABLE A.

		Quantity.							
Country.	1899	1900.	1901.	1902.	1903.				
		Barrels.	Barrels.	Barrels.	Barrels.	Barrels.			
United Kingdom,		1,007,000	1,152,000	1,395,000	1,652,000	1,402,000			
Norway,		392,700	570,000	415,000	555,000	636,000			
Netherlands,		278,000	415,000	520,000	723,000 ~	808,000			
Germany,		57,397	96,132	133,417	170,000	200,000			
Sweden,		9,300	6,000	3,000	3,000				
Total,		1,744,397	2,239,132	2,466,417	3,103,600	3,046,000			

And Table B shows the import of cured herrings into Germany over a space of five years:—

TABLE B.

	189	99.	1900.		1901.		1902.		1903.	
Origin.	Quan- tity.	Value.								
	Barls.	£	Barls,	£	Barls.	£	Barls.	£	Barls.	£
United Kingdom,	590,167	976,146	571,350	943,414	666,049	1,007,853	756,547	1,176,683	601,040	765,317
Netherlands,	224,952	363,853	310,546	501,756	371,185	526,878	451,464	706,390	533,874	602,634
Norway,	178,528	234,780	120,640	163,853	154,872	196,146	196,366	266,927	111,764	126,780
Sea (chiefly Ger- man).	69,650	129,122	120,769	223,853	164,037	272,049	157,716	261,561	198,634	251,951
Other countries,	35,609	42,439	15,584	21,561	13,150	17,707	15,286	22,244	9,543	12,000
Total,	1,098,906	1,746,340	1,138,889	1,854,437	1,369,293	2,020,633	1,577,379	2,433,805	1,454,855	1,758,682

From the above it appears that over a period of five years the

United Kingdom's share (in barrels) in the import into Germany of cured herrings fell  $12\frac{1}{2}$  per cent., that, on the other hand, the

British Share of German Imports.

 $12\frac{1}{2}$  per cent., that, on the other hand, the Netherland's share rose  $16\frac{1}{2}$  per cent. and Germany's share rose nearly  $7\frac{1}{2}$  per cent.,

while that of Norway fell off 9 per cent. The comparative share in the trade taken by the respective countries is shown more fully below:—

	Per Cont.							
Country.	1899.	1900.	1901.	1902.	1903.			
United Kingdom,	<b>6</b> 34	50	49	48	41			
Netherlands,	201	273	27	29	37			
Norway,	17	104	11	12	8			
Germany,	61	11	12	10	14			

The combined German fleets employed in herring fishing in 1904

German Herring Fishing. consisted of 138 smacks, 10 steam drifters, 8 steam smacks and 1 motor smack; 20 years ago there were in Germany 12 smacks employed in herring fishing, and 10 years

ago not half the number of vessels there are now. New companies have recently been formed at Seer, Emden, Brake, Elssleth, Töning and Cuxhaven, which it is said will commence operations with together 30 smacks and 8 steamers. There is also a project to make Cuxhaven an important fishing port and market for the sale of fish.

The combined results of German herring fishing in 1904 (i.e., of herrings cured at sea) was 261,651 kantjes\* in 718 trips, as against 242,689 kantjes in 656 trips the previous year.

In 1902 the experiment was made by the German Sea Fishery

Attempted Herring Fishing in Winter. Association of herring fishing in December and January off the coast of Norway, and of exploring the waters between Norway and the Shetland Islands. The result of this expedition, which started in the middle of

December and was carried out by the marine research steamer

<sup>\*</sup> A kantle, or sea-packed barrel contains about four-fifths of a land-packed barrel.

"Poseidon" and a steam smack, was as regards the actual catch, not very satisfactory, but the suggestive information obtained was considerable. At the same time two Geestemünde trawlers also accumulated useful information regarding the fishing grounds in those The results of these expeditions was that the Association was convinced that winter herring fishing would be possible for German steam fishing vessels, provided they were sufficiently well acquainted with the local weather conditions prevailing on the The Association, therefore, recognising the adcoast of Norway. vantage which would accrue to the German fishing industry if the herring fishing could be prolonged during the winter months, encouraged further research and furnished part of the means to carry out a trial trip, which was fitted out by the Geestemunde Herring and Deep-Sea Fishing Company, Limited, on November 24, 1904. The first night's fishing resulted in 49 kantjes, but the following days were less successful, namely, 8 to 11 kantjes per night, of which 5 to 8 kantjes were full of herrings and the rest spents. The wind, which had so far been easterly, then went round to the west and north, and blew so strong that the vessel had to make for a port. Fishing was recommenced on December 1, and the next three nights resulted in 127, 119 and 102 kantjes full herrings, besides 11 kantjes spents on the last of these nights, when the fishing had to be discontinued on account of the boisterous weather and could not be recommenced until the 9th. On that night 2 kantjes full herrings and 3 kantjes spents were taken, and on the 10th 4 kantjes full herrings and 6 kantjes spents. Weather prospects being then bad, the vessel returned to Geestemünde, where she arrived on December 14 with a total catch of 442 kantjes after an absence of 22 days. The experiment is therefore regarded at the German ports as completely successful. The herrings were not large, but of first rate quality.

The German fishing interests have of late years been more effectively protected than formerly, since two State Aid. torpedo boats have regularly assisted the special service cruiser. Owing to the vigilance of these vessels several foreign fishing steamers have in the past year been arrested on the charge of fishing inside German territorial waters, and the masters being found guilty were punished; but these special service vessels are still considered by German opinion inadequate to effectively police home waters and to

prevent German fishing interests being prejudiced by foreign Apart from these police duties the special service cruiser, at the instance of the German Sea Fishery Association, gathers all possible information regarding the movements of fish shoals, size of catches made, loss of nets, &c., and telegraphs details from the nearest port to the Association, which then places the information at the disposal of the fishing companies.

The work of the German Sea Fishery Association.

The German Sea Fishery Association devotes unremitting attention to all matters, both practical and scientific, which in any way affect the interests of the industry and trade. All subventions for the building of new sailing vessels and for providing them with outfits of nets and gear, as well as all loans to fisher-

men and fishing companies, are made by the Government, through the Association, upon the representation of the latter. matters, as well as on research and kindred objects, the Government expends annually about £20,000 for the benefit and encouragement of sea-fishing, in addition to some £2,500 or £3,000 per annum towards the expenses of the Association.

The owners of new smacks to be employed in herring fishing

Subventionsa n Grants-in-Aid. receive a building subvention of approximately £200 to £250, besides a further sum for the purchase of nets and gear, but although steamers receive no such subven-

tions, those engaged in herring fishing are nevertheless furnished by the Government with a reserve fund for making good losses in nets, which fund cannot, however, be drawn upon without the Government sanction. This reserve fund is for steamers, 5,000 marks (£243), and for sailing vessels 2,000 marks (£97). In order to assist in making good the exceptionally heavy losses in nets and gear during 1904 the Government will, it is said, contribute about £5,000 (in addition to the £20,000 referred to above) to the owners of vessels engaged in herring fishing.

The encouragement given by the Government to the fishing industry is considered to be partly due to a recognition of the prospective value of the material available for the maining of the navy.

The following items appear in the estimates for the current year 1905-06, viz.:—

	Amount.
	£
For the construction of a new fishing harbour at Neukirchen (fourth instalment),	9,000 11,951 6,951 11,000 8,751

A fishery museum, initiated by the German Sca Fishery Association in 1891, was two years ago set up in the new municipal museum at Altona, and is already so great a success that it is to be considerably enlarged and improved, the Government contributing liberally to the funds for the purchase of models, &c.

In November, 1904, the Association offered to furnish German fishermen with good reliable barometers at the very moderate price of 2s. 6d. each. In three months 475 of these barometers had been issued, and the reports upon them have everywhere been favourable.

At the instance of the German Sea Fishery Association courses of lectures on elementary nautical and

Public Lectures on Sea Fishing. kindred subjects are now delivered every year for the benefit of fishermen at 18 towns on the Baltic and at 13 towns on the North

Sea. At Geestemünde 55 such lectures were held in 1904, the attendance at which was 1,482 persons, and at Hamburg the Senate added in the winter of 1904-5 a course of eight lectures on the present state of German fishing in the North Sea to the miscellaneous series of free lectures which were instituted ten years ago at that city, and which are now carried on by 111 lecturers.

The experiments with motors on fishing smacks, instituted by the

German Sea Fishery Association, are not yet

complete, and have not, so far, given altogether satisfactory results, but it is thought at present that the 8 horse-power motor of

Danish pattern will probably be found the most satisfactory. The cost of these motors is about 12,000 marks (£585).

## OFFICIAL DOCUMENTS.

## AGRICULTURE.

## LIVE STOCK SCHEMES, 1906.

## PREFATORY NOTE.

THE schemes for the improvement of live stock for 1905 have, after consultation with the Department's Special Advisory Committees, been adopted for the year 1906, with a few minor alterations.

As several County Committees have expressed a desire that measures should be taken to improve dairy cattle by the selection and registration of dairy cows, it is proposed to arrange the details of a system applicable to the whole of Ireland, which may, with the consent of the Department, be put in force by County Committees interested in this class of stock.

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## SCHEME FOR ENCOURAGING IMPROVEMENT IN THE BREEDS OF HORSES.

1906.

## GENERAL REGULATIONS.

- 1. The main objects of this scheme are to encourage the improvement of Horse Breeding in Ireland by inducing stallion owners to keep suitable and sound sires of a high degree of excellence, and by inducing farmers to retain their best young mares for breeding purposes. When arranging the details of this scheme to suit local requirements each County Committee of Agriculture and Technical Instruction, hereinafter referred to as the County Committee, is requested to secure to small farmers as large a share of the resulting benefits as is practicable.
- 2. The sum to be provided by the Department under this scheme for encouraging improvement in the breeds of horses in a county will depend on—(1) the amount provided in aid of the scheme by local authorities, (2) the special needs of the locality, and (3) the proportion which the amount of the local contribution bears to the genuine capacity of the locality to contribute.

In accordance with Section 16 (6) of the Agriculture and Technical Instruction (Ireland) Act, 1899, the Department will not, in

the absence of special considerations, apply or approve of the application of money under this scheme in a locality out of which aid is not given either by local authorities or from other local sources.

- 3. The joint fund available under this and other live stock schemes, comprising the grant from the Department and the money provided locally, will, subject to the approval of the Department, be administered in a county in accordance with the provisions of Clauses 6 and 7.
- 4. The Secretary of the County Committee, hereinafter referred to as the Secretary, whose appointment for the year and whose duties must first be approved by the Department, shall act as Secretary to the sub-committee for live stock.
- 5. It will be the duty of the Secretary to submit, for the approval of the Department, all details of schemes proposed for his county.

No action shall be taken by any local authority towards putting this scheme into operation until the sanction of the Department has been obtained in writing.

6. The County Council should by resolution delegate to the County Committee full powers for the purposes of the Agriculture and Technical Instruction (Ireland) Act, 1899, and that Committee should appoint from among their own members an executive sub-committee for live stock.

No payments, however, in connection with this scheme shall be

authorised except by the County Committee.

7. The duties of the sub-committee for live stock will be to frame the details of the live stock schemes for the county in accordance with the conditions of the Department's general scheme, and to act as the executive committee for the administration of such county schemes when they have been approved by the County Committee and by the Department, but the executive sub-committee shall not have the power of altering or amending such approved schemes or of authorising any payment in connection with these schemes.

8. The joint fund available under this scheme shall, after the expenses of administration are provided for, be applied solely for

nominations of mares.

- 9. In the event of there not being a sufficient number of registered stallions in any county for the purposes of this scheme, the Department may provide for such county, under certain conditions to be prescribed by the Department, in either of the following ways, viz.:—
  - (1.) By assisting approved applicants, whether individuals or associations, to buy suitable stallions under the Department's scheme of loans for the purpose of stallions.
  - (2.) By giving premiums, upon terms to be prescribed, for approved stallions in the hands of private owners, who are prepared to send such stallions to districts to be approved by the Department.

## REGISTRATION OF STALLIONS.

10. Thoroughbred stallions may be registered for any county in Ireland.

All Clydesdale and Shire stallions registered in 1905 may again be offered for registration under this scheme for the particular districts in which they were registered during that year, but no other stallions of these breeds will be accepted for registration in 1906 except for the Province of Ulster, the counties of Dublin and Louth, and the district comprised within a radius of ten miles of the city of Cork.

11. The Department will publish a Register of Stallions for service under this scheme, and owners of suitable stallions are invited to apply to have their horses placed on this Register, subject to the provisions of this scheme. The Department make it a condition that a stallion, to be entitled to a subsidy in the form of nominations, or a premium, shall be registered or accepted for registration in the Department's Register of Stallions for the year 1906.

Copies of the Register, when published, may be had free of

charge on application to the Department.

12 (1.) Owners offering their stallions for registration under this scheme must, if required, submit them to inspection and veterinary examination by the Department. Notice of the arrangements as to place and method of inspection will be given.

- (2.) Thoroughbred stallions, to qualify for registration, must be entered in Weatherby's Stud Book, or, if Clydesdale or Shire, be entered in the stud book of the respective breed. If required the stallion owner or (if the stallion is being purchased with a view to registration in Ireland) the vendor must produce a certificate from the keeper of the stud book to the effect that the stallion offered for registration is entered in the stud book or will duly appear in the next volume.
- (3.) No application will be considered in which every particular required in the form of application is not supplied.
- (4.) No application for the registration of a two-year-old stallion will be considered.
- (5.) No application for the registration of a stallion will be considered unless the owner agrees to accept for service by that stallion not less than twenty, and not more than fifty, nominated mares, which are entitled to his services. This regulation is subject, however, to the conditions stated in Clauses 22 (9 and 10) and 30.
- (6.) Stallions accepted for registration will be registered for particular districts only, and shall not, without the written consent of the Department, be removed to other districts. If a stallion is removed without such consent to a district for which he was not registered, the registration of such stallion shall be cancelled.
- 13. Forms of application for the registration of stallions may be had from the Department.

One of these forms, accurately filled up in every particular and signed by the owner or his agent, must be lodged in or sent by post so as to reach the offices of the Department not later than the 30th day of September, 1905.

Applications received subsequent to that date, and before the 1st day of November, 1905, must be accompanied by a fee of

£1. Thereafter a fee of £5 must accompany each application.

14 (1.) Applications for the registration of stallions imported into Ireland after the 30th day of September, 1905, or for stallions in Ireland which have not previously been used for stud purposes, will be considered without fee if received on any date up to the 31st of March, 1906. Their entry in the published Register for 1906 cannot, however, be guaranteed, but the owners of such stallions will be accorded all the privileges enjoyed by the owners of stallions appearing in the printed Register.

(2.) Persons in Ireland intending to import stallions or to buy stallions already located in Ireland are advised not to complete the purchase until the stallions have been accepted for registration.

[See clause 18.]

(3.) The Department will, as far as practicable, supply the services of their Inspectors free of charge to persons in Ireland intending to purchase and import suitable stallions for districts in which there is not a sufficient number of registered stallions for the purposes of this scheme; but at least ten days' notice must be given, and the stallion must have been seen and provisionally approved by the intending purchaser.

(4.) The vendor must, if required, submit a certificate from the Secretary of the stud book to the effect that the animal is entered

in the stud book, or will duly appear in the next volume.

15. Stallions offered for registration may be inspected for their general merit and fitness for the purpose of the scheme. Such inspection shall be carried out by one or more Inspectors appointed by the Department. If the stallion has been to stud, evidence of his fruitfulness, and, where practicable, of the character of his stock, must be produced, if required. Inspection for general fitness, when deemed necessary, shall, as far as possible, precede veterinary examination.

16. (1.) The veterinary examination shall be carried out by one or more qualified Veterinary Surgeons, appointed by the Depart-

ment.

(2.) No stallion shall be rejected as unsound unless suffering from one of the following diseases:—Cataract, Roaring, Whistling,

Ringbone, Sidebone, Unsound Feet, Spavin, Curb.

17. The inspection for general merit and fitness and the veterinary examination of stallions offered for registration may be dispensed with in cases where evidence of suitability and soundness have been sufficiently established to satisfy the Department.

18. The Department cannot undertake to disclose their reasons for the non-acceptance for registration of any animal, but with the exceptions hereinafter mentioned the owner of any stallion in Ireland not accepted for registration may have his case reconsidered by one or more referees appointed by the Department. Every notice of appeal must be accompanied by a fee of £5, which will be returned in the event of the appeal being upheld. Notice of appeal must be given in writing within ten days from the date of the letter of rejection.

This privilege shall not extend to cases in which stallions have been rejected on appeal in a previous year or to cases in which stallions are offered for registration under clause 14 (1 and 2).

19. The Department reserve to themselves the right, without assigning any reason, or without inspection or veterinary examination, to decline to register any stallion for the purpose of this scheme.

No right of appeal shall lie in the case of stallions rejected under this clause.

20. Owners of stallions making, or promising to make, any gift to the owner of a nominated mare of a portion of the service fee, allowing a nominated mare to be served by a stallion other than that originally selected by the owner of the mare, or detected in any other fraudulent practices in connection with this scheme shall have their horses struck off the Register of the Department, and shall be debarred from obtaining any future benefit under the Department's schemes. They shall also forfeit any claim in respect of monies due to them under this scheme.

## NOMINATIONS OF MARES.

21. (1.) Upon consecutive dates, and at places to be at first approved by the Department, and duly advertised by the County Committee for at least three weeks before the date of the exhibitions by posters or in the local newspapers, one or more exhibitions of farmers' mares shall be held in each county for the purpose of issuing nominations.

(2.) Wherever practicable, and in order to avoid unnecessary expense, two exhibitions should be held on one day at two centres,

i.e., one in the morning and one in the afternoon.

(3.) The Secretary must send to the Department two copies of each poster and each advertisement immediately after they are issued.

- (4.) The Secretary shall receive entries for each exhibition on forms to be obtained from him. Each form must be signed by the owner of the mare, who, if required, must sign a statutory declaration to the effect that all the particulars given in the entry form are correct.
- 22. (1.) Mares to receive nominations must be the bona-fide property of a farmer resident in the county (with the exception of the case provided for in No. 4 of this clause).

(2.) In order to secure the second of the main objects stated in clause 1 of this scheme, preference will be given to the best young

mares under six years of age.

(3.) Each mare must be the bona-fide property of a farmer, the tenement valuation in aggregate of whose holding or holdings, wherever situated, and for which he is rated, does not exceed the limit fixed by the County Committee.

Subject to such conditions as may be prescribed by the Department, herds' mares will be eligible to compete for nominations.

(4.) A farmer whose building extends into more than one county may apply for a nomination in any one of the counties in which he holds land, provided the aggregate tenement valuation of the

holdings, wherever situated, and for which he is rated, does not exceed the limit fixed under (3) for the county in which he proposes to compete.

(5.) Subject to the provisions of Clause 10 and to the approval of the Department, nominations may be restricted to any one or

two of the breeds of registered stallions.

(6.) The mares to receive nominations shall be selected by a judge or judges appointed by the Department, and they must be passed free from any hereditary disease by a Veterinary Surgeon appointed for that purpose by the Department.

(7.) No farmer shall receive more than one nomination, unless the number of mares selected and reserved be insufficient for the granting of the full number of nominations allotted to the county,

in which case a second nomination may be awarded.

(8.) At each local exhibition all eligible mares not selected for nominations shall be placed on a reserved list in strict order of merit.

- (9.) Owners of registered stallions have a right to require hobbles to be used.
- (10.) Owners of registered stallions may refuse service to mares suffering from a contagious disease; but the reasons for such refusal must be intimated immediately to the Department and to the County Committee by the stallion owner. Mares can be served only at their owners' risk.

(11.) The County Committee may, with the approval of the Department, refuse a nomination for any mare, without assigning

any reason therefor.

- (12.) A farmer who, without sufficient cause, fails to send his nominated mare to the selected registered stallion shall be ineligible to enter mares for nomination in subsequent years.
- 23. The term "farmer" is to be understood to mean a person who derives his means of living mainly from farming.
- 24. (1.) The lists of owners of mares selected for nomination and of mares reserved must be submitted to the Department by the Secretary, within six days after the date of the last exhibition in the county, on the form supplied for the purpose.
- (2.) The dockets for the selection of stallions and the service tickets will be supplied to the Secretary, when such form, complete, has been received by the Department. The selection dockets and service tickets shall then be filled in by the Secretary, who shall return them to the Department for the necessary check and authorisation for issue.
- (3.) The Secretary, before issuing the selection docket, shall date it.
- (4.) The service ticket must not be issued by the Secretary until the owner of the mare has returned to him the selection docket with the name of the selected registered stallion duly entered thereon by the said owner.
- (5.) Not later than sixteen days from the date of issuing of the service tickets, the Secretary shall forward to the Department,, on the form provided for the purpose, particulars regarding the distribution of such tickets.

25. (1.) A farmer receiving a nomination must select one of the registered stallions in Ireland of the breed approved for the county by the County Committee, under Clause 22 (5), provided the service list of the stallion selected is not already full. See Clause 26 (2).

(2.) Such farmer must take his selection and send the name of the stallion on the selection docket to the Secretary within fourteen

days after having received such docket.

26. In any one of the following cases the nomination shall be forfeited and shall lapse:—

- (1.) If the farmer to whom a nomination is issued should fail to select a stallion within the fourteen day limit.
- (2.) If the owner of the mare is also the owner of the registered stallion selected.
- (3.) If the farmer to whom a nomination is issued should permit his nominated mare to be served by a stallion other than that originally selected.
- (4.) If the nominated mare should die before first service.
- (5.) If the nominated mare should be sold before the date of the first service.

The Secretary shall cancel and return to the Department the numbered tickets for all such lapsed nominations, and may issue to the owners of mares strictly in the order in which they appear on the reserve list new tickets to be obtained from the Department in lieu of such cancelled tickets.

- 27. A nomination is not transferable, and is available only for the selected mare.
- 28. The service season shall be reckoned to begin on the 1st day of March, 1906, and to terminate on the 31st day of July, 1906.
- 29. The value of the nomination fee shall be uniform for the county, but may vary with the breed of stallions selected, and shall not be less than £2, or more than £3.
- 30. (1.) When the service fee exceeds the value of the nomination, the excess shall be paid by the owner of the mare to the owner of the stallion at the time of the first service, or at such other time as may be agreed upon between them.

(2.) In addition, the farmer shall pay a groom's fee of 2s. 6d.

for each nominated mare.

31. (1.) Not earlier than the 1st August, 1906, and not later than the 1st October, 1906, the owners of registered stallions shall forward to the Secretary the selection dockets and the service tickets for the services effected by their sires, accompanied by a statutory declaration to the effect that the conditions of service have been duly complied with.

(2.) The form of declaration required under this clause may be

had on application to the Secretary.

(3.) The Secretary shall examine and check all these documents, and when correct shall forward them to the Department.

(4.) Payment of nomination fees to owners of stallions shall not be made until the Department have been satisfied as to the fulfilment of the conditions of this scheme, and have signified in writing their approval of each particular payment.

- 32. No payment shall be made in any of the following cases—
  - (1.) Where any erasure or alteration appears on either the selection docket or the service ticket.

(2.) Where both the selection docket and the service ticket bearing corresponding numbers are not produced.

- (3.) Where a nomination issued in respect of a particular nominated mare is used for another mare, whether nominated or not.
- (4.) Where service has been effected by a stallion other than that originally selected.

(5.) Where an owner who received a nomination failed to send his mare for service.

- (6.) Where the owner of a registered stallion fails to lodge by 1st October, 1906, with the Secretary, in the manner provided in Clause 31, his claim for payment of nomination fees.
- 33. Owners of mares accepting, or agreeing to accept, from a stallion owner, portion of the service fee, changing nominations, substituting mares, or detected in any other fraudulent practices in connection with these regulations shall be debarred from obtaining any future benefits under the Department's schemes.

34. In all cases of dispute in matters connected with this scheme

the decision of the Department shall be final.

 $\frac{A}{05}$ 

# SCHEME FOR ENCOURAGING IMPROVEMENT IN THE BREEDS OF CATTLE.

1906.

- 1. The main objects of this scheme are to improve the dairy and store cattle in Ireland by encouraging the breeding or introduction of pure bred bulls of a high degree of excellence, and by inducing associations of farmers or persons of means to purchase high class bulls for the use of small farmers.
- 2. The sum to be provided by the Department under this scheme for encouraging improvement in the breeds of cattle in a county will depend on—(1) the amount of money provided in aid of the scheme by local authorities, (2) the special needs of the locality, and (3) the proportion which the amount of the local contribution bears to the genuine capacity of the locality to contribute.

In accordance with Section 16 (6) of the Agriculture and Technical Instruction (Ireland) Act, 1899, the Department will not, in the absence of special considerations, apply, or approve of the application of money under this scheme in a locality out of which aid is not given either by local authorities or from other local

sources.

3. The joint fund available under this and other live stock schemes, comprising the grant from the Department and the money

provided locally, will, subject to the approval of the Department, be administered in a county by the County Committee of Agriculture and Technical Instruction, hereinafter referred to as the County Committee, in accordance with the provisions of Clauses 6 and 7.

4. The Secretary of the County Committee, hereinafter referred to as the Secretary, whose appointment for the year and whose duties must first be approved by the Department, shall act as Secretary to the sub-committee for live stock.

5. It will be the duty of the Secretary to submit, for the approval of the Department, details of all schemes proposed for his county.

No action shall be taken by any local authority towards putting this scheme into operation until the sanction of the Department has been obtained in writing.

6. The County Council should by resolution delegate to the County Committee full powers for the purposes of the Agriculture and Technical Instruction (Ireland) Act, 1889, and that committee should appoint from among their own members an executive subcommittee for live stock.

No payments, however, in connection with this scheme shall be

authorised except by the County Committee.

7. The duties of the sub-committee for live stock will be to frame the details of the live stock schemes for the county in accordance with the conditions of the Department's general scheme, and to act as the executive committee for the administration of such county schemes when they have been approved by the County Committee and by the Department; but the executive sub-committee shall not have the power of altering or amending such approved schemes or of authorising any payment in connection with these schemes.

8. The joint fund available under this scheme shall, after the expenses of administration are provided for, be applied solely in

providing premiums for bulls.

9. In exceptional circumstances the Department may, under certain conditions to be prescribed by them, provide for a county either by purchasing bulls on behalf of applicants selected by County Committees under Clause 17, or by granting loans to approved applicants who desire to purchase bulls through the Department.

Applications under this clause must be made—by the selected individuals—directly to the Department not later than 1st March, 1906.

- 10. Subject to the approval of the Department, premiums may be restricted to any one or more breeds of pure bred bulls, except Galloway, Welsh Runt, Ayrshire, Kerry, and Dexter, for which special provision may be made after consultation with the committees of the counties concerned in the breeding of this class of stock.
- 11. Only bulls entered, or qualified by pedigree by entry, in the herd books of their respective breeds shall be eligible for premiums. The owner of a bull not entered must, if required, produce a certificate from the secretary of the herd book to the effect that the bull is eligible for entry and will duly appear in the next volume.

- 12. Bulls of the following ages are eligible to compete for premiums:—
  - (1.) Yearlings, calved between 1st September, 1904, and 1st May, 1905;
  - (2.) Two-year-olds, calved between 1st September, 1903, and 31st August, 1904.
  - (3.) Three-year-olds, calved between 1st September, 1902, and 31st August, 1903.
  - (4.) Four-year-olds, calved between 1st September, 1901, and 31st August, 1902.

All bulls must show a high degree of excellence. Two-year-olds, three-year-olds, and four-year-olds which show signs of having been badly cared, or which are not fully developed, will not be selected.

- 13. The amount of a premium for a high-class bull shall be £15, payable, subject to the regulations of this scheme, at the close of the season. Where special provision for the use of Galloway, Welsh Runt, Kerry, Dexter, and Ayrshire bulls is made with the approval of the Department, the value of the premiums shall be £10.
- 14. The owners of all two-year-old, three-year-old, and four-year-old bulls applying for premiums under this scheme must, if required, produce evidence of the fruitfulness of the bulls in the preceding year.
- 15. (1.) Bulls which were awarded premiums in 1905 will be inspected by the Department prior to the spring shows and sales, at local centres only, on dates of which the owners will be duly advised by the Department.

In no case will animals be inspected at the owner's residence.

- (2.) Owners of such bulls failing to present their animals for inspection on the dates selected will not have their cases reconsidered.
- (3.) Bulls which have been exhibited at local centres and provisionally selected for a premium must stand for service at the same place as in 1905, and unless in exceptional circumstances approved by the Department, owners of selected bulls will not be allowed to change the premium to a yearling bull.

(4.) The Department will furnish the County Committee with a list of bulls which have been passed at such local centres for premiums in 1906

premiums in 1906.

(5.) The County Committee shall then proceed to select applicants for premiums for bulls to be selected at any of the principal shows or sales of bulls. In making such selections regard shall be had to the needs of the various districts in the county.

16. Bulls, of the ages specified in Clause 12, other than those referred to in Clause 15 (4), shall be selected at the principal spring shows and sales. The provisional selection of bulls for premiums at these shows and sales shall be made by the Department alone.

Intending purchasers must make their own selection from the list of animals passed by the Department.

17. (1.) The County Committee shall, by means of advertisements in the local papers or by posters, invite applications from

persons who, if selected, are prepared to keep in the districts not provided for in Clause 15 (3 and 4) premium bulls to be chosen at one or other of the principal shows or sales. Such applications must be made on forms to be obtained from the Secretary.

(2.) A list of such applicants, when selected by the County Committee, should be forwarded to the Department by the Secretary, on the form provided for that purpose, not later than five days be-

fore the show or sale at which the bulls are to be selected.

(3.) The Department's Inspector or Inspectors will attend at the principal shows and sales. They shall not be empowered to recognise applications from any persons appearing at the shows or sales whose names are not on the list supplied by the Secretary as having been duly selected to keep a premium bull.

(4.) Applicants selected by a County Committee who exhibit or purchase at one of the principal shows or sales provisionally selected bulls of the breeds approved by the County Committee need not again show these bulls in 1906 for a premium. The granting of a premium to a bull shall not in any way be regarded

as affording a right to a premium in a subsequent year.

(5.) As soon as a selected applicant has procured a bull which has been provisionally passed for a premium he should notify the Secretary on a form to be obtained from the latter for the purpose. The Secretary shall thereupon advise the Department on the prescribed form of the particulars as to location, &c., of each bull.

18. There shall be no exhibitions of bulls in 1906, such as were held under the 1902 and 1903 schemes.

19. The service season for a premium bull shall not commence until the owner of the bull has been informed by the Secretary that the Department have approved of the selection of the bull for a premium. It will be the duty of the Secretary to obtain the sanction, in writing, of the Department with the least possible delay.

The service season for premium bulls shall close on 31st Decem-

ber, 1906.

20. The Secretary shall supply the owner of each premium bull under this scheme with posters, which such owner must undertake to distribute in the district in which the bull is to serve.

- 21. Each premium yearling bull shall serve not less than thirty cows, and all other premium bulls not less than forty cows each, other than those that are the property of the owner of the bull. The service fees for the number of cows stated shall in all cases be 1s. each, inclusive of all charges. After the minimum number of cows have been served the owner may fix such fee as he may desire.
- 22. The County Committee may make such regulations as they think necessary with regard,
  - (1) to the inclusion or otherwise of four-year-old bulls,
- (2) to the number of premium bulls which any one person may keep, provided that no person shall possess two premium bulls of the same breed unless located at least three miles from each other,
- (3) to the place in which a premium bull shall remain during the season for service,

(4) to the penalties to be imposed upon the owner of a premium bull who fails to take proper care of the animal,

(5) to the number of cows which any one farmer may send to

a premium bull, and

(6) to the exclusion of pedigree cows from this scheme.

23. Each cow shall be the property of a farmer resident in the county, the aggregate tenement valuation of whose holding or holdings wherever situated and for which he is rated, does not exceed the limit fixed by the County Committee.

Herds, artisans and bona fide agricultural labourers may obtain

service for their cows on the same terms as farmers.

24. The term "farmer" is to be understood to mean a person who

derives his means of living mainly from farming.

25. The owner of a premium bull shall not, before the stipulated number of cows have been served, reserve the use of the bull for the cows of any individual or of the members of any society. He must, subject to the provision of Clause 31, allow the bull to serve cows in the order in which they are presented.

26. The Department reserve the right to brand or mark premium

bulls, and to inspect them from time to time.

27. The Department also reserve the right to apply the tuber-

culin test, at their own expense, to any premium bull.

28. (1.) Not earlier than 1st September, 1906, and not later than 15th January, 1907, the owner of a premium bull shall forward to the Secretary a form containing a return of the names, addresses, and valuations of the persons whose cows have been served by the bull, at the fee named in Clause 21, together with dates of such services, as well as a statutory declaration, signed before a magistrate other than the owner of the bull, certifying that the said cows have been duly served, and that all the regulations of this scheme have been strictly complied with.

(2.) The Secretary shall examine and check all such forms, and

when correct shall forward them to the Department.

(3.) As soon thereafter as the Department are satisfied as to the fulfilment of the conditions of this scheme the Secretary will be notified that payment of the premiums or part of the premiums payable under this scheme may be made to the owners of the bulls.

(4.) Any premium not applied for on or before 15th January, 1907, shall be considered as having lapsed.

Forms for the declaration required by this Clause may be had on

application to the Secretary.

29. All owners of premium bulls must satisfy the County Committee that they have provided themselves with a syringe and disinfecting materials for the washing of their animals after each service, in accordance with the instructions given in the Department's leaflet No. 13, on Contagious Abortion in Cattle.

It will be the duty of the Secretary to obtain the necessary information for the Committee, and to notify the Department at an

early date of the results of his enquiries.

30. In the event of the bull being unable from any cause to complete the prescribed number of services, the Department reserve

the right to withold the premium, or any part of it, or in any other way to deal specially with the case, according as the circumstances

may require.

31. The owner of a premium bull has the right to refuse the use of his bull in any case where he is satisfied that the service would be prejudicial to the animal. The reasons for such a refusal must however, be communicated to the County Committee immediately on the refusal of the application.

32. In all cases of dispute in matters connected with this scheme

the decision of the Department shall be final.

A 51.

# SCHEME FOR ENCOURAGING IMPROVEMENT IN THE BREEDS OF SWINE.

1906.

Clauses 1 to 7, inclusive, of the Department's Horse and Cattle Schemes, 1906, shall, with the necessary modifications apply to this scheme.

#### SWINE.

8. The system to be adopted in connection with this scheme for encouraging improvement in the breeds of swine shall be the provision of premiums for selected pure-bred boars.

9. Subject to the approval of the Department premiums may be

restricted to any one or more pure breeds of swine.

10. Only boars eligible for entry in the Herd-books of their particular breeds, or in the Register of Pigs of the Royal Dublin Society shall be selected for premiums. The owner of a boar selected for a premium must have the animal entered in the proper Herd-book or in the said Register as the case may be.

11. Boars belonging to any Society or to any Association of Farmers shall be eligible, if pure-bred, to compete for premiums; but the premiums shall be paid to the Society or Association, and

not to the individuals in whose charge the boars are placed.

12. Boars when selected for the first year's premium should be not less than five months or more than twelve months old. The grant of a premium to any boar shall not be regarded as affording any right to a premium in a subsequent year.

13. The value of a premium shall be £5 for the first year, and

£3 for the second year.

14. Only those boars which were awarded first year premiums in 1905 shall be eligible for second year premiums in 1906. All such boars must show a high degree of excellence. Two-year-old boars which show signs of having been badly cared or are not fully developed will not be selected.

The owner of a boar selected for a second year premium must produce evidence of the fruitfulness of the boar in the preceding

year.

15. A boar which may be awarded a premium in 1906 out of funds administered by any other body shall not be eligible for a premium under this scheme.

16. (1.) Boars which were awarded first year premiums in 1905 will be inspected by the Department at local centres on dates of

which the owners will be duly advised by the Department.

(2.) Owners of such boars failing to produce their animals for inspection on the date selected will not have their cases reconsidered.

(3.) Boars which have been exhibited at local centres and provisionally selected for a premium must stand for service at the same place as in 1905, and unless in exceptional circumstances approved by the Department, owners of selected boars will not be allowed to change the premium to a yearling boar.

(4.) The Department will furnish the County Committee with a list of boars which have been passed at such local centres for

premiums in 1906.

(5.) The County Committee shall then proceed to select applicants for premiums for young boars. In making such selection regard shall be had to the needs of the various districts in the county.

17. (1.) The County Committee shall by means of advertisements in the local papers or by posters, invite applications from persons who, if selected, are prepared to keep premium boars in districts not already provided for under Clause 16 (4) of this scheme. Such applications must be made on forms to be obtained from the Secretary.

(2.) As soon as a selected applicant has procured a boar which has been provisionally passed for a premium he should notify the Secretary on a form to be obtained from the latter. The Secretary shall thereupon advise the Department on the prescribed form of the particulars as to the location, &c., of each premium boar.

18. The provisional selection of boars for premiums shall be made by the Department alone at the principal spring shows and at local centres to be fixed by the Department, but no inspection for the purpose of this scheme shall be made after the 30th June, 1906, save in exceptional circumstances.

19. The Department, through the County Committee, will as far as practicable assist intending purchasers to secure suitable boars

for the purposes of this scheme.

- 20. The service season for a premium boar shall not commence until the owner of the boar has been informed by the Secretary that the Department have approved of the selection of the boar for a premium. It will be the duty of the Secretary to obtain the sanction (in writing) of the Department with the least possible delay. The service season for premium boars shall close finally on the 31st December, 1906.
- 21. The Secretary shall supply the owner of each premium boar under this scheme with posters, which the said owner must undertake to distribute in the district in which the boar is to serve.
- 22. Each yearling premium boar must serve not less than 30 sows, and each two-year-old boar not less than 40 sows. The service fee, inclusive of all charges for this number of sows, shall

not exceed 1s. for each sow. After the minimum number of sows have been served, the owner of the boar may fix such fee as he may desire.

23. The County Committee may make such regulations as they

think necessary with regard-

(1.) to the breed or breeds of boars to be selected,

(2) to the number of premium boars which any one applicant may possess, (provided no person shall possess two premium boars of the same breed unless located at least three miles from each other),

(3.) to the place in which a premium boar shall remain during

the season for service,

(4.) to the penalties to be imposed upon the owner of a premium boar who fails to take proper care of the animal, and

(5) to the number of sows which any one farmer may send to a

premium boar under this scheme.

24. Each sow shall be the property of a farmer resident in the county, the aggregate tenement valuation of whose holding, or holdings, wherever situated, and for which he is rated, does not exceed the limit fixed by the County Committee.

Herds, artisans, and bona fide agricultural labourers may obtain

service for their sows on the same terms as a farmer.

25. The term "farmer" is to be understood to mean a person

who derives his means of living mainly from farming.

26. The owner or owners of a premium boar shall not, before the stipulated number of sows have been served, reserve the use of the boar for the sows of any individual, or of the members of any society. Subject to the provisions of Clause 30, sows must be served by a premium boar in the order in which they are presented.

27. The Department reserve the right to brand or mark premium

boars, and to inspect them from time to time.

28. (1.) Not earlier than 1st September, 1906, and not later than 15th January, 1907, the owner of each premium boar shall forward to the Secretary a form containing a return of the names, addresses, and valuations of the persons whose sows have been served by the premium boar—together with dates of such services—at the fee named in Clause 22, as well as a statutory declaration, signed before a magistrate, other than the owner of the boar, certifying that the said sows have been served, and that all the regulations of this scheme have been complied with.

(2.) The Secretary shall examine and check all such forms, and

when correct shall forward them to the Department.

(3.) As soon thereafter as the Department are satisfied as to the fulfilment of the conditions of this scheme, the Secretary will be notified that payment may be made to the owner or owners of the boar of the premium, or part of the premium, payable under this scheme.

(4.) Any premium not applied for on or before the 15th January, 1907, shall be considered as having lapsed.

Forms for the declaration required by this clause may be had on

application to the Secretary.

29. In the event of a boar being unable, from any cause, to complete the prescribed number of services, the Department reserve the right to withold the premium, or any part of it, or in any other way to deal specially with the case, according as the circumstances may require.

30. The owner of a premium boar has the right to refuse the use of his boar in any case where he is satisfied that the service would be prejudicial to the animal. The reason for such refusal must, however, be communicated to the County Committee, immediately

on the refusal of the application.

31. In all cases of dispute in matters connected with this scheme the decision of the Department shall be final.

A 53.

# LOANS FOR THE PURCHASE OF STALLIONS. 1906.

1. No application for a loan for the purchase of a Stallion will be considered if coming from a locality in which, in the opinion of the Department, there is already a sufficient number of registered Stallions for the purpose of their scheme.

2. The individual or association applying for a loan must be ap-

proved by the Department.

3. No loans will be made save for the purchase of Stallions passed by the Department as eligible for registration in 1906.

4. The purchase price of the Stallion must be approved by the

Department.

- 5. Before the loan is granted the purchaser must pay to the Department the premium for the insurance of the Stallion at its full value, i.e., the amount of the purchase price, and the payment to the Department of the annual premiums on this insurance must be secured under conditions similar to those provided for the repayment of principal and interest. (See 7 and 8.)
- 6. Approved applicants for a loan must lodge with the Department the amount of the premium as above, together with one-third of the purchase price of the Stallion.
- 7. As soon thereafter as possible the individual or association to whom the loan is granted, shall enter into a bond to repay the Department the amount which will be advanced by them—viz., two-thirds of the purchase money in five equal annual instalments, at the end of one, two, three, four, and five, years, respectively, from the date of payment of the full purchase price to the vendor by the Department, together with interest at the rate of  $2\frac{1}{2}$  per cent. on the outstanding balance.
- 8. In the case of an individual, two or more solvent sureties approved by the Department, in addition to the purchaser must guarantee repayment. In the case of an association repayment must be guaranteed by the Committee of the association, or in such other manner as the Department may require.

9. On receipt by the Department of (1) the premium for insurance, (2) one-third of the agreed on purchase money, (3) the necessary stamp duty, and (4) the bond duly completed, the Department will pay to the vendor the full amount of the agreed on purchase price, and intimate to him that possession of the Stallion may be given up to the borrower.

10. If the vendor, before being paid by the Department, gives up possession of the Stallion, the Department will hold themselves

free of any liability to the vendor.

11. The individual or association must offer the Stallion each year for registration, must undertake to conform at all times to the regulations of the Department's schemes for encouraging improvement in the breeds of horses, and during the continuance of the loan must allow the Stallion to serve nominated Mares at a fee to be fixed by the Department.

Such fee, however, in no case to exceed £3 per mare.

12. Nominated Mares, the property of the members of an association purchasing a Stallion under this scheme, shall not take priority of service over nominated mares owned by non-members.

As soon, however, as the number of nominated Mares required by the scheme may have been served, the service of the Stallion may be retained exclusively for the use of the members of such association.

- 13. The individual in whose favour the loan is being granted must observe the following conditions:—
  - (1) In the event of the horse becoming ill or lame, he must without delay give notice in writing or by telegram to the Department. Like notice must be given—
    - (a) If the horse meets with any accident or injury, and
    - (b) If the horse dies. In the latter event he must furnish at his own expense a certificate from a Veterinary Surgeon,
  - (2) He must provide proper accommodation for the Stallion, and care him in a proper manner to the satisfaction of the Department.
  - (3) He must procure at his own expense the services of a Veterinary Surgeon when necessary.
- 14. The Department shall have the right to inspect the Stallion at any time, and to remove him at any time, if it is found, in the opinion of the Department, that he is not being properly cared, or if an instalment of the principal and interest is in arrear for more than four weeks.
- 15. The Stallion shall remain the property of the Department until all instalments or arrears of principal and interest are paid off, and shall not be disposed of, without the consent of the Department, for five years.
- 16. Should the Stallion be awarded a premium, such premium shall not be paid to the individual or association in possession of the Stallion, but shall be credited, after the close of the season, towards the repayment of the loan.

17. The Department reserve the right to refuse any application for a loan without assigning any reason for such refusal.

18. The decision of the Department in all matters relating to

these loans shall be final.

Forms of application can be had from the Department.

A 54. 05.

### LOANS FOR THE PURCHASE OF BULLS.

1906.

1. Applications for loans for the purchase of Bulls must be made by each applicant—on the prescribed form—direct to the Department before 1st March, 1906.

2. No application for a loan for the purchase of a Bull will be considered if coming from a locality in which, in the opinion of the Department, there is already a sufficient number of pure bred Bulls for the purpose of their scheme.

3. No loan will be granted save for the purchase of a pure bred yearling Bull, passed by the Department as suitable for a premium. The Bull must be of a breed approved by the County Committee.

4. The purchase price of the Bull must be approved by the De-

partment.

5. A person applying for a loan under this Scheme must purchase through the Department, who cannot undertake to consider applications for loans in respect of animals purchased without their knowledge at shows, sales or from private individuals.

6. Before taking possession of the Bull the applicant must pay to the Department's representative—(1) one-third of the approved purchase price, (2) the stamp duty, and (3) the charge for insurance (see Clause 11). Further, he must sign a form of undertaking to have the necessary form of guarantee for repayment duly signed and completed.

7. As soon thereafter as possible, the approved applicant and two approved solvent sureties shall sign a form of guarantee to repay to the Department the amount which will be advanced by them-viz., two-thirds of the purchase price-in two equal annual instalments, at the end of one and two years respectively, from the date of payment of the full purchase price to the vendor by the Department, together with interest at the rate of  $2\frac{1}{2}$  per cent. on the outstanding balance.

8. In the case of an association the person in whose charge the Bull is to be placed must, with two other approved members of the association in their capacity of private individuals, guarantee re-

payment of the loan.

9. Should the Bull be awarded a county premium (1) the person in whose favour the loan is being granted must conform to the regulations of the Department's scheme for the improvement of the breeds of cattle, or any modifications therein made, with the

- approval of the Department, by the County Committee; and (2) the amount of such premium shall be paid to the individual in possession of the Bull, after the provisions of the general scheme have been complied with.
- 10. Each Bull purchased under this scheme must be insured with the Department by the applicant for a loan.
- 11. The charge for insurance against death shall be 5 per cent. on the full purchase price. This charge must be paid to the Department, who will, subject to all the regulations of the scheme being complied with, insure the Bull as from the date of payment of such charge until the loan has been repaid, but in no case will the insurance cover a period longer than two years from date of payment of this charge.
- 12. In the event of the death of the Bull within twelve months from the date of payment to the Department of the charge for insurance, a sum equal to three-fourths of the loan will be credited by the Department in reduction of the amount due by the applicant in respect of loan and interest.
- 13. If the Bull dies in the second year, provided the first instalment was paid to the Department before the expiration of the period allowed for repayment thereof, under Clause 7, a sum equal to one-half of the original loan will be credited by the Department in reduction of the balance due by the applicant in respect of loan and interest.

The insurance, however, shall be cancelled in the event of the first instalment not being paid within the period prescribed under Clause 7. (See also Clause 15).

- 14. The individual in whose favour the loan is being granted must observe the following conditions:—
  - (1.) In the event of the Bull getting ill or lame he must, without delay, give notice in writing or by telegram to the Department. Like notice must also be given (a) in the event of any accident or injury occurring to the Bull, and (b) in case of the death of the Bull.
  - (2.) He must take all reasonable precautions to prevent the Bull from coming into contact with any animal suffering from disease.
  - (3.) He must provide proper accommodation for the Bull and care him in a proper manner, to the satisfaction of the Department.
  - (4.) He must procure at his own expense a syringe and disinfecting materials for the washing of his Bull after each service, in accordance with the instructions given in the Department's leaflet No. 13 on contagious abortion in Cows.
  - (5.) He must procure at his own expense the services of a Veterinary Surgeon when necessary.
  - (6.) In the case of the death of the Bull he must forward a certificate from a Veterinary Surgeon as to the cause of death.

15. The non-observance of any one of the conditions of this scheme will render the insurance void, and all moneys paid there-

for will be forfeited to the Department.

16. The Department shall have the right to inspect the Bull at any time, and to remove him at any time, if it is found, in the opinion of the Department, that he is not being properly cared, or in the event of an instalment of principal and interest being in arrear for more than four weeks.

17. The Department reserve the right to brand or mark the

Bull, and to inspect it from time to time.

18. The Department also reserve the right to apply the tuberculin test, at their own expense, to any Bull purchased by means of a loan from the Department.

19. The Bull shall remain the property of the Department until

all instalments of principal and interest are paid off.

20. The Department reserve the right to refuse any application for a loan without assigning any reason for such refusal.

21. The granting of a loan does not imply that a premium will

be awarded in respect of the Bull.

- 22. The Department will, as far as possible, endeavour to procure suitable animals for persons to whom loans are to be granted, but they cannot undertake to supply Bulls at a price fixed by the applicant.
- 23. The decision of the Department in all matters relating to these loans shall be final.

Forms of application for loans can be had from the Department.

 $\frac{A 57}{05}$ .

# SCHEME OF SUBSIDIES TO IRISH DRAUGHT, HUNTER, AND HALF-BRED SIRES.

#### 1906.

- 1. The Department are prepared to subsidise for any part of Ireland, subject to the regulations of this scheme, a number of approved sires of the Irish Draught or Hunter type, as well as ponies suitable for the poorer districts.
- 2. The Department will publish a list of the approved Stallions accepted for the purpose of this scheme in 1906.

Copies when issued may be had free on application.

Owners of suitable Stallions are invited to apply to have their horses placed on this list subject to the provisions of this scheme.

3. Forms of application for the purpose of this scheme may be had from the Department.

One of these forms, accurately filled up in every particular, and signed by the owner or his agent, must be lodged in, or sent by post so as to reach, the offices of the Department not later than the 31st October, 1905.

4 (1.) Owners offering their stallions for service under this scheme must, if required, submit them to inspection and veterinary examination by the Department. Notice of the centres to which the

horses are to be brought for inspection will be given.

(2.) No application for the subsidising of a stallion under this scheme will be considered unless the owner agrees to accept for service by that stallion, at a fee not exceeding £1 per service and 2s. 6d. groom's fee, at least fifty mares the property of herds or of farmers whose tenement valuation does not exceed £30. (In exceptional circumstances the Department may raise the maximum limit of the valuation to £50.)

The Department will in addition grant the owner a bonus of £1 per mare for each selected mare not exceeding 50 in number served

by a stallion under this scheme at a fee of £1.

(3.) No application will be considered in which every particular

required in the form of application is not supplied.

- (4.) Stallions approved under this scheme will be accepted for particular districts only, and shall not, without the written consent of the Department, be removed to another district. If a stallion is removed without such consent to a district for which he was not accepted the owner of such stallion shall forfeit all claim to the benefits of this scheme.
- (5.) All sires which have received a certificate under the Scheme of Subsidies to Irish Draught, Hunter, and Half-bred Sires, in 1905, may, at the discretion of the Department, be accepted without further inspection, but an application in respect of a sire over four years old which has, on inspection, been previously rejected as unsuitable shall not be considered under this scheme.
- 5. Stallions offered under this scheme may be inspected for their general merit and fitness for the purposes of the scheme. Such inspection shall be carried out by one or more Inspectors appointed by the Department. If the stallion has been to stud, evidence of his fruitfulness and, where practicable, of the character of his stock, must be produced if required. Inspection for general fitness, when deemed necessary, shall, as far as possible, precede veterinary examination.

6. (1.) The Veterinary examination shall be carried out by one or more qualified Veterinary Surgeons appointed by the Depart-

ment.

- (2.) No stallion shall be rejected as unsound unless suffering from one of the following diseases:—Cataract, roaring, whistling, ringbone, sidebone, unsound feet, spavin, curb.
- 7. The inspection for general merit and fitness and the veterinary examination of stallions offered under this scheme may be dispensed with in cases where evidence of suitability and soundness have been sufficiently established to satisfy the Department.
- 8. The Department cannot undertake to disclose their reasons for the non-acceptance of any animal, and they reserve to themselves the right without assigning any reason therefor or without inspection or veterinary examination to decline to accept any stallion for the purposes of this scheme. No right of appeal shall lie in the case of any stallion rejected under this scheme.

9. The owner shall advertise the sire to the satisfaction of the Department.

10 (1.) Exhibitions of mares which are intended to be sent for service to stallions accepted under this scheme will be held on dates and at control to be fixed by the Department.

and at centres to be fixed by the Department.

Such exhibitions will be duly advertised by posters in the districts where accepted Stallions will be located during the season of 1906.

- (2.) The selection of mares at these exhibitions will be made by the Department alone.
- (3.) The Department, on being satisfied as to the valuation of the owner of each selected mare, will supply him with a voucher certifying that the mare in question is eligible for service under this scheme by an accepted Stallion. This document must be given up to the owner of the sire on the date of first service.

(4.) Mares to be served under the provisions of this scheme must

be the bona fide property of farmers or herds.

(5.) The term "farmer" is to be understood to mean a person

who derives his means of living mainly from farming.

- (6.) A farmer shall not be entitled, save with the approval of the Department to have more than one mare served under this scheme. Before service the owner of each mare, if a farmer, must if required furnish the stallion owner with a certified statement of his valuation.
- 11. The owner of a stallion accepted under this scheme shall not, before the stipulated number of mares have been served, reserve the use of his stallion for the mares of any individual or for members of any society; but must, subject to the provisions of Clause 14, allow his stallion to serve mares in the order in which they are presented.
- 12. The service fee fixed under Clause 4 shall be paid by the owner of the mare to the owner of the stallion at the time of first service, or at such other time as may be agreed upon between them.
- 13. Not earlier than the 1st August, 1906, and not later than 1st September, 1906, the owner of the stallion shall forward to the Department a form containing a return of the names, addresses, and valuations of the persons whose mare have been served by the stallion at the prescribed fee of £1, as well as the vouchers referred to in Clause 10 (3), accompanied by a statutory declaration, signed on the prescribed form before a magistrate other than the owner of the stallion, certifying that the said mares have been duly served, and that all the regulations of this scheme have been strictly complied with. As soon thereafter as the Department are satisfied as to the fulfilment of the conditions of this scheme, payment of the bonus will be made to the stallion owner by the Department.

Forms for the declaration required by this clause may be had on application to the Department.

- 14. The stallion owner has the right to refuse the service of his stallion under this scheme in the following circumstances, viz.:—
- (1.) Where the valuation of the owner of the mare exceeds £30 or £50 as may be fixed by the Department.

(2.) Where the owner of the mare refuses to pay the fee at time of first service, and

(3.) Where the mare is believed to be suffering from a contagious

disease.

15. In all cases of dispute in matters connected with this scheme, the decision of the Department shall be final.

> A 52. 05.

## SUBSIDIES TO AGRICULTURAL AND INDUSTRIAL SHOWS,

1906.

- 1. In 1906, County Committees of Agriculture may, subject to the approval of the Department, make grants in aid of—
  - (a), Established Agricultural Poultry, Horticultural, and Farm Produce Shows held under the auspices of an Agricultural Society;

(b) Industrial Shows or Exhibitions, and

(c) Ploughing Matches, Skilled Labour Competitions and Implement Trials.

In allocating the funds available under this scheme, County Committees should consider the claims of the various Shows held in the county and the special requirements of particular districts.

A Show Society, proposed to be subsidized under this scheme by a County Committee, must furnish, not later than 1st February, 1906, to the Department, through such County Committee, the following particulars in respect of each Show held by the Society in 1905, viz.:—

(1.) An audited balance sheet, setting forth in detail the financial position of the Society after all liabilities have been discharged, and also

(2.) If required, a list certified by the Secretary of the Show Society, setting forth the amounts actually collected in local subscriptions from private individuals in 1905.

Any Society which fails to furnish these particulars, or such further information as the Department may require, shall not be eligible to receive a subsidy.

2. In approving of the amount to be granted to any particular

show, the Department will take into consideration:-

(1.) The amounts actually collected in local subscriptions from private individuals in 1904 and 1905.

(2.) The total value of prizes awarded in 1905, and the cost of

administration.

- (3.) The regard paid by the Society to the furtherance of the Department's Live Stock, Poultry, and other County Schemes.
- (4.) The amount set aside for classes confined to small farmers.

3. The prize schedule for 1906 must, prior to publication, be submitted in duplicate through the County Committee to the Department for approval in writing. Non-compliance with this regulation may entail the cancellation of the grant from the County Committee in 1906.

The Department will not consider any schedule which has not previously received the approval of the County Committee.

- 4. The joint contribution from the County Committee and the Department must be acknowledged in the prize schedule.
- 5. In the case of Live Stock Shows, other than shows confined to Horses, provision must be made in the schedule of prizes for the inclusion of classes for Sheep and also for Poultry of the breeds subsidized by the County Committee.
- 6. Each Society receiving a subsidy under this scheme shall, if required, afford all reasonable facilities for the inspection of their books by the Department, and shall admit the Department's Inspectors to the judges' ring during all adjudications on the day of the Show.
- 7. A portion of the joint fund available under this scheme may be given to new Show Societies, provided the Department are satisfied:—
  - (1.) That there is need for such new Societies in the county;
  - (2.) That adequate local support is forthcoming; and
  - (3.) That the rules and financial proposals of the Society are deemed satisfactory.
- 8. Only in very exceptional circumstances will the Department be prepared to sanction the holding of local exhibitions for the award of prizes by a County Committee.
- 9. The cost of employing judges must be defrayed by Show Societies out of their own funds. The Department cannot undertake to supply the services of a Judge or Demonstrator for any Show or local exhibition as they have done in previous years.
- 10. Immediately after the Show the Secretary of the Society shall furnish to the Department, through the Secretary of the County Committee, a certificate of the total amount actually awarded in prizes at the Show, and the Department may then instruct the Secretary of the County Committee to lodge to the credit of the Show Society the amount of the grant already approved.
- 11. In all cases of dispute in matters connected with this scheme the decision of the Department shall be final.

The Department recommend that each Agricultural or other Show Society receiving a subsidy under this Scheme should invite the County Committee to nominate one or more representatives to act on the Show Committee.

# SCHEME FOR ENCOURAGING IMPROVEMENT IN THE FLAX-GROWING INDUSTRY, 1905-6.

The following programme has been adopted by the Department for encouraging improvement in the flax-growing industry during the season 1905-6:—

#### I.—FIELD EXPERIMENTS.

Variety tests and manurial experiments will be continued. The object of these experiments is to ascertain the relative value of various varieties of flax seed and the influence of certain manures on the yield and quality of the flax crop. Experiments on seed selection will also be undertaken. A report on the experiments carried out in 1904 has appeared in No. 3, Vol. 5, of the Department's Journal, and will also be published and distributed in leaflet form.

#### II .- RIPPLING EXPERIMENTS.

With a view to testing whether rippling may be profitably undertaken in this country experiments will be again carried out in 1905-6 and a report on the results will be published.

#### III.—ARTIFICIAL RETTING.

The Flax Supply Association propose to continue at Millisle the experiments on the drying of green straw for the purpose of determining whether flax retting on the artificial system can be profitably carried out in Ireland.

#### IV .- COLLECTION OF STATISTICS.

An attempt will again be made to collect statistics with reference to the flax crop through the managers of co-operative flax societies.

#### V.—Scutching Tests.

The scutching trials started four years ago at Carthall, near Coleraine, to test various systems of scutching, will be continued during 1905-6 with such modifications as previous experience may suggest.

### VI.—FORMATION OF FLAX SOCIETIES.

The Department, subject to conditions to be prescribed by them, are prepared in a limited number of cases to assist farmers in establishing co-operative flax societies by paying a portion of the salary of an approved manager, and by granting loans for the erection of machinery.

Applications for assistance of this nature should be made to the Secretary of the Department. As soon as the Department are satisfied that the conditions are favourable for the formation of a society an organiser will be sent to the district.

# VII.—PRIZES FOR GROWERS AND FOR OWNERS OF AND EMPLOYEES OF SCUTCH MILLS.

The Department have set aside a sum of money to enable the County Committee in each of the counties interested in flax-growing—

- (A.) To hold a number of flax shows on the same lines as in the past four years.
- (B.) To offer prizes to growers for flax on foot.
- (C.) To offer prizes to scutch mill-owners, scutchers, and employees in scutch mills on the result of inspection of scutch mills.
- A County Committee may adopt sections A and B or sections B and C, or any one of these sections.

#### SECTION A.

For the purpose of this section a county may be divided into districts, in each of which a show of scutched flax will be held, at which it is suggested the following prizes be offered:

### (A.)—Growers.

First prize, . . . 3 bags flax seed.

Second prize, . . . 2 ,, ,, Third prize, . . . 1 bag ,,

### (B.) -- Scutchers.

Scutchers employed in the mill where the first prize lots were scutched:—

2 bags flax seed.

Scutchers employed in mills where the second prize lots were scutched:—

1 bag flax seed.

## (c.) -Other employees.

For other persons employed in the mill where the first prize lots were scutched:—

2 bags flax seed.

Similar employees in mills where the second prize lots were scutched:—

1 bag flax seed.

## (D.)-Mill-owners.

This class may be omitted if the County Committee so desire.

Owners of mills in which the first prize lots were scutched:—

2 bags flax seed.

Owners of mills in which the second prize lots were scutched:—

1 bag flax seed.

#### SECTION B.

For the purpose of this section the county may be divided into districts, in each of which prizes for flax on foot may be offered,  $\epsilon.g.:$ —

- (a.) For growers the valuation of whose holding does not exceed £10, and who grow at least half a statute acre of flax.
- (b.) For growers the valuation of whose holding exceeds £10, but does not exceed £25, and who grows at least one statute acre of flax.
- (c.) For growers the valuation of whose holding exceeds £25 but does not exceed £50, and who grow at least two statute acres of flax.
- (d.) For growers the valuation of whose holding exceeds £50. and who grow at least three statute acres of flax.
- N.B.—The limits of valuation in the foregoing classes are not prescribed; they are merely inserted as an indication to County Committees to encourage the small grower.

When judging growing crops the judge shall take into consideration:—

- (a.) Freedom of crops from weeds;
- (b.) Uniformity of crop;
- (c.) Length and quality of crop.

#### SECTION C.

For the purpose of this section the county may be divided into districts, in each of which it is suggested that prizes be offered as follows:—

- (a.) Three or more prizes to be competed for by the owners of scutch mills.
- (b.) A like number of prizes to the scutchers employed in the successful competing mills.
- (c.) A like number of prizes to other employees engaged in the successful mills.

When inspecting scutch mills the judge shall take into consideration:—

- (a.) The general arrangements (buildings, machinery, storage).
- (b.) The quality of scutching (handling of flax).
- (c.) Care and disposal of tow.
- (d.) General management.

#### GENERAL REGULATIONS.

1. A County Committee adopting this scheme shall appoint a special sub-committee for flax, which must be restricted to six members, each of whom should be an experienced grower or scutcher of flax; and this sub-committee shall be given full authority to administer the county scheme when sanctioned in writing by the Department.

2. The sub-committee shall be responsible for organising shows under section A, and for making all arrangements in connection with sections A, B, and C; but no payments under this scheme shall be authorised, except by the County Committee.

3. The County Committee shall, by means of advertisements in the local papers and by posters, invite applications on special forms from persons in the county desirous of competing for the prizes Copies of these posters must be foroffered under this scheme. warded to the Department.

4. All prizes under this scheme, whether in conection with section A, or C, shall be paid in flax seed only, which will be procured by the Department and sold to the County Committee at cost price. In connection with section B, the prizes may be paid in money or seed at the discretion of the County Committee.

5. Not later than the 26th September, 1905, and not less than six weeks before the date of the first show, the County Committee must submit, for the approval of the Department, on the form pro-

vided for the purpose, a complete statement showing:—

In regard to section A—(1) the classes to be provided at each show; (2) the quantity of flax to be exhibited by one person in each class, which should not be less than 16 stones; (3) the number and value of the prizes to be offered: (4) the place, suggested date, and hour of each show. (N.B.—Two or more alternative dates, being flax market days, should be suggested for each show); (5) the instructions to exhibitors, together with such conditions of award, in addition to the compulsory provisions in the following clauses as the Committee may consider desirable.

In regard to section B—(1) the number of districts into which it is proposed to divide the county; (2) the limits of valuation in each class; (3) the number and value of prizes in each class.

In regard to section C-(1) the number of districts into which it is proposed to divide the county; and (2) particulars as to prizes to be offered to millowners, scutchers, and other employees respectively. (N.B.—A list of the names and addresses of the competing scutch mill-owners, the number of scutchers and other employees engaged in each such mill, must be submitted to the Department on the form provided for the purpose within six days after the close of the period for receiving entries.)

6. All growers of flax shall be eligible to compete for prizes in sections A and B, subject to the regulations of this scheme.

7. Under section A no grower shall be paid more than one prize during the season, and under this same section no individual can

receive a prize both as a grower and as a mill-owner.

8. If, in the opinion of the judge, the flax exhibited under section A, the crop inspected under section B, or the work inspected in scutch mills under section C, does not show sufficient merit, the prizes must be witheld.

9. If it be discovered that any fraud, deception, or dishonest practice has been committed, either in connection with the preparation or ownership of the scutched flax or growing flax, or in any representation regarding exhibits of growing crop or scutch mills which may have affected, or have been intended to affect, the

decision of the judge or judges, the offending person shall be disqualified, and shall be debarred from obtaining any future benefits under the Department's scheme. He shall also forfeit any claim in respect of prizes awarded under this scheme. The Department reserve to themselves the right to publish the names of such person if deemed expedient.

10. No action shall be taken by any local authority towards putting any portion of this scheme into operation until the sanction of the Department to the Committee's proposals has been obtained in writing. The scheme, when sanctioned by the Department,

must be considered as final for the year.

11. The County Committee shall, subject to the approval of the Department, appoint a competent judge or judges under this scheme. The person appointed must not be a resident of the

county in which he is to act.

12. (1.) Not later than six days after the holding of each show the Secretary of the County Committee shall submit to the Department for approval, on the form provided for the purpose, a statement showing the name and address of each of the prize-winners under section A, and the quantity of flax seed to which each winner is entitled. (2) Similar returns in respect of competitions in section B and section C should be furnished to the Department within one week after the work of judging has terminated. (3) The awards will not be final until the sanction of the Department has been conveyed in writing to the Secretary.

13. The Secretary of the County Committee shall keep a separate account of the expenditure in connection with each section of this scheme, and shall furnish same to the Department when required.

14. Subject to the foregoing regulations being complied with, the Department will be prepared to refund County Committees 50 per cent. of all authorised expenditure under this scheme.

15. The decision of the Department in all matters of dispute in connection with this scheme shall be final.

A 45 05.

# SCHEME OF INSTRUCTION IN AGRICULTURE, 1905-6.

- 1. The Department are prepared, provided a suitable Instructor in Agriculture can be obtained, to approve of the appointment of at least one such person for each county in Ireland. In the case of new appointments no person shall be eligible for an Instructorship in the county of which he is a native, or in which he resides permanently.
- 2. The Department will, as far as possible, assist the County Committee in obtaining an Instructor, by supplying the names of persons qualified for the post.
- 3. The remuneration of the Instructor shall not, except in special cases, exceed £200 per annum, inclusive of maintenance and hotel

expenses, in addition to expenses of locomotion, which include second or third class railway fare as decided by the County Committee, car hire when necessary, or a bicycle allowance not exceeding 2d. per mile in lieu thereof.

4. The employment of the Instructor under this scheme shall not continue beyond the 30th September, 1906, and is terminable at any time previous to that date by the giving of 3 months' notice

in writing on either side.

5. It will be the duty of the Instructor to deliver courses of lectures on agricultural subjects, such as soils, manures, seeds, pastures, crops and their cultivation, breeding, feeding, and management of live stock; to visit farms; to conduct such experiments and demonstrations in spring and summer as may be approved by the Department; to select suitable land for this purpose; to supervise the sowing of the seeds and manures and the keeping of the plots free from weeds; to weigh the produce, tabulate the figures, and prepare a report on the results; to assist, if required, in the teaching at Agricultural Classes established with the approval of the Department; to reply to letters from farmers seeking information; to advise farmers how they may avail themselves of the Department's Live Stock Schemes and of the Department's Seed-Testing Station; to make known the provisions of the Fertilizers and Feeding Stuffs Act; to advise farmers how they can best avail themselves of all schemes which may be adopted by the County Committee and by the Department, and how they may take advantage of agricultural organisation; to report to the Department and to the County Committee regarding the progress of his work, either weekly or otherwise, as may be required; and generally to give his whole time to the work and do all in his power to further the interests of agriculture in the county.

The Instructor may also be required to act as judge in connection with the Scheme of prizes for cottages and small farms in a

county other than that in which he acts as Instructor.

6. For the purposes of this scheme the county should be divided into circuits, each comprising not less than five centres. The Instructor, unless in exceptional cases, should work for three or four weeks in each circuit, and deliver one lecture per week at each centre during that time. The Instructor will, when invited to do so, visit either on the day of the lecture or on the following day, any of the farms in the neighbourhood, and give such information on practical subjects as the circumstances of the case may suggest.

The County Committee are alone responsible for the selection of centres and arrangement of lectures. No work of this nature should be undertaken by the Instructor, though it is desirable

that he should be consulted.

In selecting centres the County Committee should have particular regard to districts in which lectures may not have been

given in previous years.

7. It will be the duty of the County Committee to select centres at which the lectures will be given, and to appoint a local committee with an honorary secretary at each centre who should select the school or other building and arrange for the hiring, lighting, and warming of the room in which the lectures will be delivered.

It will also be the duty of the County Committee to undertake the responsibility of seeing that the Instructor's time is fully and usefully employed.

The County Committee shall keep a separate account of all expenditure under this Scheme and shall furnish detailed statements of such expenditure as may from time to time be required by the

Department.

8. Lectures should be arranged to be given in school-rooms or other suitable public rooms in the evenings, and should be held in Towns and the larger villages should be avoided, rural centres. as experience has shown that the greatest success attends those lectures which are given in the rural parts of a county, especially when the lectures are delivered in a district where the greatest number of farmers is to be found. The local committee at each centre should be responsible for appointing a representative chairman for each lecture as well as for the distribution of the short syllabus of the lectures which will be prepared by the lecturer as soon as he is appointed. The local committee should undertake to have posters and handbills, which will be supplied by the Secretary of the County Committee, effectively displayed and distributed throughout their district. A copy of each poster and handbill should be forwarded to the offices of the Department one week prior to the commencement of the lectures in each circuit. Each lecture should be followed by a discussion, during which farmers will be invited to ask questions relative to their business.

9. The lectures should commence early in autumn, and be con-

tinued until the end of February.

10. No action shall be taken by the County Committee towards putting this scheme, or any part thereof, into operation until the sanction of the Department has been obtained in writing.

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# SCHEME FOR ENCOURAGING INPROVEMENT IN THE POULTRY-KEEPING INDUSTRY.

1905-6.

- 1. The Department are prepared, provided a suitable Instructor in Poultry-Keeping can be obtained, to approve of the appointment of at least one such person for each County in Ireland. In the case of new appointments no person shall be eligible for the position of Instructor in the county of which he or she is a native or in which he or she resides permanently.
- 2. The Department will, as far as possible, assist County Committees in obtaining an Instructor by supplying the names of persons qualified for the post.
- 3. Unless in exceptional circumstances the remuneration of the Instructor shall not exceed £2 per week, in addition to expenses of

locomotion, which include second or third class railway fare, as decided by the County Committee, car hire when necessary, or a bicycle allowance not exceeding 2d. per mile in lieu thereof.

4. The employment of the Instructor under this scheme shall not continue beyond the 30th September, 1906, and is terminable at any time previous to that date by the giving of four weeks'

notice in writing on either side.

5. It will be the duty of the Instructor to deliver courses of lectures on poultry-keeping, including the selection of breeds, the hatching and rearing of chickens, the feeding and housing of poultry, and the marketing of the produce; to give demonstrations and lessons on the treatment of common diseases, such as gapes, &c., the cramming of fowls and on the plucking, trussing, and preparation of poultry for market, and on the grading and packing of eggs; to visit poultry runs, and give such practical advice as may be desired by poultry-keepers, to inspect the egg distribution and turkey stations referred to in Clauses 11 and 13, to report to the Department and to the County Committee regarding the progress of his or her work either weekly or otherwise as may be required, and generally to give his or her whole time towards promoting improvement in poultry-keeping in the county.

6. For this purpose the county should be divided into circuits, each comprising not less than five centres. The Instructor, except in special cases, should work for at least four weeks in each circuit, and deliver one lecture per week at each centre during that time. The Instructor will, when invited to do so, visit either on the day of the lecture or on the following day, any of the poultry runs in the neighbourhood, and give such information on poultry-keeping

as the circumstances of the case may suggest.

The County Committee are alone responsible for the selection of centres and the arrangement of lectures. No work of this nature should be undertaken by the Instructor, though it is desirable that he or she should be consulted.

7. It will be the duty of the County Committee to select centres at which the lectures will be given and to appoint a local committee, with an honorary secretary, at each centre, who should select the school and arrange for the hiring, lighting, and warming of the room in which the lectures will be delivered.

In selecting centres the County Council should have particular regard to districts in which lectures may not have been given in

previous years.

It will also be the duty of the County Committee to undertake the responsibility of seeing that the Instructor's time is fully and

usefully employed.

The County Committee shall keep a separate account of all expenditure under this scheme, and shall furnish detailed statements of such expenditure as may from time to time be required by the Department.

8. Lectures should be arranged, wherever possible, to be given in schoolrooms or other suitable public rooms in the evenings, and should be held in rural centres only. Towns and the larger villages should be avoided, as experience has shown that the

greatest success attends those lectures which are given in the rura! parts of a county, especially when the lectures are delivered in districts where the greatest number of those interested in poultry-The local committee at each centre should keeping is to be found. be responsible for appointing a representative chairman for each lecture, as well as for the distribution of the short syllabus which will be prepared by the lecturer as soon as appointed. local committee should undertake to have posters and handbills, which will be supplied by the Secretary of the County Committee, effectively displayed and distributed throughout the circuit. Copies of these posters and handbills should be forwarded to the Department at least a week prior to the commencement of each course of lectures. Each lecture should be followed by a discussion, during which farmers and others interested in poultry-keeping will be invited to ask questions relative to their business. Where a course of lectures has already been given a new syllabus should be presented.

9. The lectures should commence early in autumn and be continued until the end of the hatching season. If employed during the summer months, the Instructor should, during that season, visit poultry runs, inspect egg distribution stations, and give lessons

and demonstrations in cramming, trussing, &c.

10. The Instructor will be required to visit all the egg distribution stations in the county at least four times between the months of October and April. These inspections shall only be made between the finish of one course and the beginning of another course of lectures. After each inspection the Instructor shall submit reports to the County Committee and to the Department.

### DISTRIBUTION OF SETTINGS OF EGGS OF PURE BREEDS.

#### Hens and Ducks.

- 11. In counties where instruction in poultry-keeping has been provided, the Department are prepared to sanction a limited number of premiums of £5 each being awarded to selected applicants who distribute during the season at least 70 settings of eggs; those who distribute less will be paid in proportion to the number distributed. No maximum number of settings to be distributed is fixed, but owners of stations must continue selling eggs at the fixed price until May 31st. The owner may set eggs for his own use, but such settings will not count towards a premium. Applicants must agree to comply with the following conditions:—
  - (1.) To keep one pure breed of hens only. In exceptional cases the Department may approve of more than one pure breed being kept, provided they are satisfied that the selected person, houses, runs, birds, &c., are suitable.
  - (2.) To sell or destroy any existing fowl on the farm of which the Instructor or the Department may disapprove, and not to bring on the farm during the period for the distribution of eggs fowl of any description without the sanction of the Instructor and of the Department.

(3.) To keep no male birds on the farm other than those sanctioned for stock purposes of the breed or breeds of fowl approved of.

(4.) To dispose of the male birds in use during 1904-5 and to replace these with others unrelated to the stock at the

station.

(5.) When a premium is claimed for hens alone, to keep not less than thirty or more than sixty of the selected breed. If the premium is claimed in respect of hens and ducks, not less than five ducks and twenty-five hens must be kept, or ten ducks and twenty hens, but the total number of birds to be kept at any one station should not exceed sixty. At least one cock or cockerel must be kept for every ten hens or pullets, and one drake for every five or six ducks. Only one breed of ducks can be kept.

(6.) To replace each year at least one-third of the hens with

early hatched pullets.

(7.) To provide proper housing where such does not already exist, and in the case of two breeds being kept to provide a separate run for each to the satisfaction of the Instructor and the Department. The size of run for any flock of birds will require to be at least twenty square yards per bird.

(8.) To feed and care for the birds in such a manner and in such a way as the Instructor and the Department may re-

quire.

(9.) To supply, during the whole of the season, settings of eggs from the selected birds to any person in the county at 1s. per dozen (the purchaser to bear the cost of package and carriage), and to replace infertile eggs that are returned within one month from the date on which they were sent out.

In special cases the Department may sanction an increase in the price of eggs, provided the County Committee show sufficient reasons for so doing.

(10.) To stamp all the eggs given out with a stamp provided

for the purpose by the County Committee.

(11.) To keep in a special book provided by the County Committee an accurate record of all eggs laid and distributed. This book must be sent to the Secretary of the County Committee, or to the Department when asked for by either of these bodies. The books must be returned to the Secretary of the County Committee at the end of the distributing season, which will commence on the 1st December, 1905, and terminate on the 31st

May, 1906. (See Clause 17.)

(12.) To permit the Instructor and the Department to inspect the birds at any time.

Any infringement of the above rules may entail the cancellation of the premium.

12. An additional grant of 50 per cent. of the actual cost, but in no case exceeding £2, may be made to the selected persons who provide themselves for the purpose of this scheme with portable wooden fowl-houses approved by the Department. This will apply

only to persons who are taking up the scheme in 1905-6 for the first time. No grant will be made in respect of improvements in an existing house, and if a new house is obtained it must be portable.

### Turkeys.

- 13. Premiums of £2 each may be offered to persons who are prepared to comply with the following conditions:—
  - (1.) To keep one or more pure-bred American Bronze stock turkey cocks for the service of turkey hens, the property of any persons residing in the county, at a fee of 6d. per service. Each cock must serve twenty hens exclusive of the owner's. If a smaller number are served, the premium will be proportionately reduced. After twenty hens have been served the owner may refuse to allow the bird to serve more or may charge a higher fee. The stock birds must be not less than the following weights on 1st January, 1906, viz.:—Cockerels, 22 lbs.; adult birds, 28 lbs. Birds more than three years old are not eligible for premiums.
  - (2.) To provide proper housing accommodation, and to feed and care for the birds in such a maner as the Instructor and the Department may require.

(3.) To keep no turkey cock other than the bird or birds

approved for the purpose of this scheme.

(4.) To keep in a special book, provided by the County Committee, an accurate record of services. This book must be sent to the Secretary of the County Committee or to the Department when required, and in any case must be returned to the Secretary of the County Committee not later than the 7th June, 1906.

(5.) To permit the Instructor or the Department to inspect

the birds at any time.

Any infringement of the above rules may entail the cancellation of the premium.

A station-holder under the 1904-5 scheme will not be eligible to hold a premium under the 1905-6 schemes unless the bird kept in 1904-5 is exchanged or a new one purchased.

A premium may be granted for a turkey cock selected in 1904-5, provided the bird is suitable in every respect, and is located at a

different station in the same or another county.

14. An applicant will be eligible for only one premium either for hens or for hens and ducks combined, but he will, in addition, be eligible to hold a premium for turkeys. No premium, however, will be given for ducks alone.

One of the following breeds of hens and ducks must be

selected:--

#### HENS.

## Laying Breeds.

Minorcas. White Leghorns. Brown Leghorns.

### General Purpose Breeds.

Houdans. Plymouth Rocks (Barred variety recommended). Orpingtons (Buff variety recommended). White Wyandottes. Salmon Faverolles, Sussex.

#### DUCKS.

Indian Runner. Aylesbury. Pekin.

- 15. As soon as the Instructor has been appointed and the number of premiums proposed to be awarded has been approved of by the Department, the County Committee shall invite applications from persons in the county who already possess, or are willing to purchase, pens of the approved pure breeds of hens or ducks, or to keep one or more pure-bred turkey cocks, and who are prepared to comply with the above conditions. When these applications have been received the County Instructor in Poultry-Keeping will, as soon as possible, inspect and report to the County Committee as to the number of suitable applicants. The names of the selected applicants, with full particulars as to the breeds, number of birds, and housing, should then be submitted for the approval of the Department, who may thereupon further inspect the selected farms, and submit a list of those of which they approve to the County Committee for their final selection.
- 16. The Department will not consider applications from a county in respect of premiums under this scheme later than 1st December, 1905.

County Committees who intend to adopt this scheme should have all arrangements completed prior to the 1st January, 1906.

- 17.—(1.) Not later than 7th June, 1906, the selected applicants for premiums must forward to the Secretary of the County Committee the record books referred to in Clauses 11 (11), and 13 (4), accompanied by a statutory declaration certifying that the entries in these books are correct, and that all the conditions of this scheme have been complied with.
- (2.) As soon as the Department are satisfied as to the fulfilment of the conditions of this scheme, the Secretary of the County Committee will be notified that payment may be made by the Committee of the premiums or portions thereof payable under this scheme.
- (3.) Any premium not applied for by the 7th June, 1906, shall be considered as having lapsed.

Forms for the declaration required by this clause may be had on application to the Secretary of the County Committee.

18. No action shall be taken by the County Committee towards putting this scheme, or any part thereof, into operation until the sanction of the Department has been obtained in writing.

## Special attention is directed to Clause 12.

# SCHEME OF INSTRUCTION IN HORTICULTURE AND THE MANAGEMENT OF BEES, 1905-6.

1. The Department are prepared, provided a suitable Instructor in Horticulture and Bee-keeping can be obtained, to approve of the appointment of at least one such person for each County in Ireland. In the case of new appointments no person shall be eligible for the position of Instructor in the county of which he is a native, or in which he permanently resides.

2. The Department will, as far as possible, assist the County Committee in obtaining an Instructor, by supplying the names of persons qualified for the post. If a County Committee should find it impossible to obtain a person competent to give instruction in both branches the Department may sanction the employment of

separate Instructors for each subject.

3. The remuneration of the Instructor shall not, unless in exceptional circumstances, exceed £2 per week, in addition to expenses of locomotion, which include second or third-class railway fare, as decided by the County Committee, car-hire when necessary, or a bicycle allowance not exceeding 2d, per mile in lieu thereof.

4. The employment of the Instructor under this scheme shall not continue beyond the 30th September, 1906, and is terminable at any time previous to that date by the giving of four weeks' notice

in writing on either side.

- 5. It will be the duty of the Instructor to give demonstrations and to deliver lectures on horticultural subjects, such as soils, manures vegetable, fruit, and flower cultivation, plant diseases, and insect pests; to visit gardens and orchards, and give practical demonstrations on spraying, planting, pruning and grafting of fruit trees; to conduct such experiments and other demonstrations in the spring and summer as may be approved by the Department; to select suitable land for this purpose; to supervise the sowing of the seeds and manures, and the keeping of the plots free from weeds; to weigh the produce, tabulate the figures, and prepare a report on the results; to give instruction in the principles and practice of modern bee-keeping; to deal with diseases of bees; to reply to letters from those seeking his advice on horticultural and bee-keeping subjects; to report to the Department and to the County Committee on the progress of his work either weekly or otherwise, as may be required; and generally to give his whole time to the work and to do all in his power to further the interests of horticulture and bee-keeping in the county.
- 6. The Instructor shall report to the County Committee on all cases of foul breed which may come under his notice. He may, subject to the consent of the owner of the bees being previously obtained by him, destroy infected stocks by burning them, and shall take all due precautions against the spread of the disease.

He must advise in writing the County Committee of each case in which stocks are so destroyed, and the County Committee may, if they think fit, pay to the owners of such stocks a sum not exceeding 5s, for each stock destroyed, provided that the amount set aside in the County Scheme for compensation under this clause shall not be exceeded.

7. For the purposes of this scheme the county should be divided into circuits. The Instructor should work for three or four weeks in each circuit, and give lectures and demonstrations during that time. In cases, however, where an Instructor may be employed to give instruction in bee-keeping only it will not be necessary to divide the county into circuits. In such instances demonstrations can be arranged for at centres from which applications have been made through the Secretary of the County Committee for his services. The Instructor will visit gardens, orchards or apiaries in the district, and give such information on practical subjects as the circumstances of the case may suggest.

The County Committee are alone responsible for the selection of centres for lectures and demonstrations. No work of this nature should be undertaken by the Instructor, though it is desirable that he should be consulted.

8. It will be the duty of the County Committee to select centres at which the lectures and demonstrations will be given, and to appoint at each centre a local committee, with an honorary secretary, who should select the school and arrange for the hiring, lighting, and warming of the room in which the lectures will be delivered.

In selecting centres the County Committee should have particular regard to districts in which lectures and demonstrations may not have been given in previous years.

It will also be the duty of the County Committee to undertake the responsibility of seeing that the Instructor's time is fully and usefully employed.

The County Committee shall keep a separate account of all expenditure under this scheme, and shall furnish detailed statements of such expenditure as may from time to time be required by the Department.

9. Lectures should be arranged to be given in school-rooms or other suitable public rooms in the evenings, and should be held Towns and the larger villages should be avoided, in rural centres. as experience has shown that the greatest success attends these lectures which are given in the rural parts of a county. The local committee at each centre should be responsible for appointing a representative chairman for each lecture as well as for the distribution of the short syllabus of the lectures which will be prepared by the lecturer as soon as he is appointed. The local committee should undertake to have posters and handbills, which will be supplied by the Secretary of the County Committee, effectively displayed and distributed throughout their district. Copies of these posters and handbills should be forwarded to the Department at least a week prior to the commencement of each course of lectures. lecture should be followed by a discussion, during which persons interested in horticulture and bee-keeping will be invited to ask questions. Where a course of lectures has already been given a new syllabus should be presented.

10. The horticultural demonstrations should commence early in

autumn and be continued throughout the whole year.

11. In each circuit one demonstration plot may be selected for the purpose of growing vegetables, flowers, and fruit, and showing improved methods of cultivation. The seeds, manures, and fruit trees, and, if necessary, fencing will be, subject to approval of Department, paid for out of the sum set aside for demonstration plots, the labour to be given gratuitously by the persons providing

the plots, and the produce to be their property.

12. The County Committee may purchase fruit, forest and other trees, shrubs, or plants, in bulk, and resell them at cost price, including carriage, to farmers and cottagers in the county. As, however, it has come to the knowledge of the Department that trees and plants infested with disease have been imported into Ireland, it will be necessary for County Committees who intend to put this clause into operation to invite tenders from nurserymen and before acceptance to submit them to the Department for examination. The Department may, if they think it advisable, inspect the trees, &c., that are offered for sale, and satisfy themselves that they are suitable and free from disease.

13. No action shall be taken by the County Committee towards putting this scheme, or any part thereof, into operation until the

sanction of the Department has been obtained in writing.

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## INSTRUCTION IN BUTTER-MAKING, 1905-6.

- 1. The Department are prepared, provided qualified Instructors can be obtained, to approve of the appointment of an Instructor in Butter-making in each county. In the case of new appointments no person shall be eligible for the position of Instructor in the county of which she is a native or in which she permanently resides.
- 2. The Department will, as far as possible, assist the County Committee in obtaining an Instructor, by supplying the names of persons qualified for the post.
- 3. The remuneration of the Instructor shall not exceed £2 per week, in addition to expenses of locomotion, which include second or third class fare as decided by the County Committee, car-hire when necessary, or a bicycle allowance not exceeding 2d. per mile in lieu thereof.
- 4. The employment of the Instructor under this scheme shall not continue beyond the 30th September, 1906, and is terminable at any time previous to that date by the giving of four weeks' notice in writing on either side.
- 5. The instruction will take the form of daily lessons on dairying, accompanied by practical instruction in butter-making. Each

course shall extend for a period of not less than two, and not more than four weeks. Not more than twelve pupils should be admitted to each class. Pupils must undertake to attend regularly.

6. On the first day of visiting each centre the Instructor should give a public lecture and demonstration, and during the remainder of the course at that centre should conduct a class daily in which pupils only will take part, but which shall be open to the public.

It will also be the duty of the Instructor to visit home dairies in the county and to give advice as required; to give where possible during that part of the day not required for class work, demonstrations in the making of butter, by means of the equipment actually in use in the dairies visited; to reply to letters from persons seeking advice on butter-making; to report to the Department and to the County Committee on the progress of her work either weekly or otherwise as may be required; and generally to give her whole time to the work of the Committee.

7. It will be the duty of the County Committee to select suitable centres at which classes will be held, and to appoint at each centre a local committee, with an honorary secretary, who will be responsible for the local arrangements necessary for the proper carrying out of the work, and who will be required to comply with the annexed conditions. The local committee should undertake to have posters and hand-bills, which will be supplied by the Secretary of the County Committee, effectively displayed in the neighbourhood of the centre. Copies of these posters and hand-bills should be forwarded to the Department at least a week prior to the commencement of each class.

It will also be the duty of the County Committee to undertake the responsibility of seeing that the Instructor's time is fully and usefully employed.

The County Committee shall keep a separate account of all expenditure under this scheme, and shall furnish detailed statements of such expenditure as may from time to time be required by the Department.

8. To avoid expense and to ensure success these classes should be held, as far as possible, in schoolrooms or other suitable buildings in rural centres. Unless in exceptional circumstances no class should be held in a large village or town, or near a creamery.

The County Committee are alone responsible for the selection of centres and arrangements of lectures. No work of this nature should be undertaken by the Instructor, though it is desirable that she should be consulted.

9. No action shall be taken by the County Committee towards putting this scheme into operation until the sanction of the Department has been obtained in writing.

### CONDITIONS REQUIRED OF LOCAL COMMITTEES.

- I. To secure premises suitable for a working dairy, if possible, not less than 25 feet by 18 feet, or other dimensions affording similar floor space. Either a public room, schoolroom, or barn with good floor, would be suitable for the purpose.
  - II. To secure a sufficient supply of water.

- III. To provide on the premises means of heating at least fifteen gallons of water at one time, for use in cleansing utensils, &c.
- IV. To provide sufficient milk or cream for use in the school, the Committee taking responsibility of sale of butter.

After the opening day at each centre about three gallons of milk and six gallons of cream will be required for each day's work. Arrangements should be made to have the milk and the cream delivered in the morning.

- V. To guarantee not less than six and not more than twelve pupils to attend on each of the days over which the course of instruction extends.
- VI. To arrange for the carriage of utensils from one centre to another. The weight of the utensils is usually from 25 to 30 cwts., and they are somewhat bulky.

The Department recommend the following list of utensils for a travelling dairy school attended by twelve pupils:—

			AŢ	Approximate Cost,		
				£	; s	. d.
6	End-over-End Churns, at £3,	•	. 1	8	0	0
6	Butter Workers, at 37s. 6d., .		. 1	1	5	0
6	Butter Boards, at 2s.,			0	12	0
4	Large Butter Boards, at 3s. 6d.,			0	14	0
6	Scoops, at 1s.,			0	6	0
6	Sieves, at $2s$ . $6d$ .,	•		0	15	0
6	Pairs Scotch Hands, at 2s. 6d.,			0	15	0
6	Squeegees, at 1s.,			0	6	0
6	Scrubbing Brushes, at 1s.,			0	6	0
6	Thermometers, at 1s. 6d.,			0	9	0
6	White Enamelled Buckets, at 5s. 6d.,			1	13	0
6	Iron Buckets, at 4s. 6d.,	•		1	7	0
4	Shallow Tins (Cream), at 4s.		. (	0	16	0
1	Pair Scales,			0	19	0
1	Set Iron Weights $(7, 4, 2, 1, \frac{1}{2} & \frac{1}{4} \text{ lb.}),$		. (	0	4	6
1	Set Brass Weights (2, 1, 1 & 1 oz.), .		. (	0	5	6
1	Set Creamometers,		. (	0	6	6
1	Lactometer,		. (	0	1	6
1	Gerber Butter-fat Tester (2 Bottles), about		. :	2	10	0
1	2-Quart Measure,		. (	)	2	6
4	Quart Measures, at 1s. 9d.,		. (	)	7	0
	Pint Measures, at 1s. 3d.,		. (	)	5	0
2	Skimmers, at 8d.,		. (	0	1	4
	Hand Separator (17 gallons per hour),	•	. 7	7	10	0
	Portable Boiler (15 gallons),		. :	2	14	0
	, , , , , , , , , , , , , , , , , , , ,		•			
			£52	2	10	10

The above equipment allows one churn and butter worker, and one set of the smaller utensils for two students. A dash churn may be included in the equipment when the County Committee deem it desirable.

### TECHNICAL INSTRUCTION.

Circular 39.

DEPARTMENT OF AGRICULTURE AND
TECHNICAL INSTRUCTION FOR IRELAND,
UPPER MERRION-STREET, DUBLIN,
September, 1905.

SIR, OR MADAM.—I have to acquaint you that the Department are informed that an Industrial Exhibition will be opened in April next, at Milan, to the Industrial Arts Section of which exhibits of Lace, Crochet, Embroidery, Homespuns, Tweeds, Rugs, etc., will be admitted.

The Department do not propose to take any official part in the exhibition, but they are of opinion that it will afford Irish Industries an opportunity of extending their trade in Italy, where, the Department understand, there is a growing demand for the commodities named.

Application for further information with regard to this exhibition should be addressed to the Secretary, London Chamber of Commerce, Oxford Court, Cannon-street, London, E.C., who is acting as Secretary to a Committee in whose hands the organisation of the British Section has been placed by the Government.

I am,

Sir, or Madam,

Your obedient Servant.

T. P. GILL.

Secretary.

To

The Proprietor. Secretary, or Manager of the Industry named in the Address.

Form S. 125.

DEPARTMENT OF AGRICULTURE AND
TRCHNICAL INSTRUCTION FOR IRELAND,
UPPER MERRION-STREET,
DUBLIN.

Telegraphic Address,

" Resources, Dublin."

## LOCAL EXAMINATIONS, 1906.

The Local Examinations in subjects of Science and Art, conducted by the Department on behalf of the Board of Education (South Kensington), will begin on Saturday, 28th April, 1906. Attention is directed to the Regulations for the conduct of these examinations in Ireland, printed below, which supersede those contained in Part II. of the Regulations of the Board of Education for 1905-6.

Special attention is directed to Paragraph 5 of the Regulations, and it is pointed out that, while candidates will be admitted to the examinations in Stage 1 of Science and Art subjects on the conditions therein stated, presentation at these examinations will not be a condition of the award of grant in that stage, nor will the results of examination affect the rate of grant to be allowed.

The Department will hold special examinations for Teachers' qualifications in Experimental Science on Saturday, the 12th May, 1906. Full information respecting these examinations has been published in a separate Form (No. S. 108). Application for admission to this examination must be made upon Form S 118, which will not be accepted after the 28th February.

Candidates for the Irish Secondary Teachers' Drawing Certificate who desire to present themselves for the special examinations in Elementary Modelling to be held in April, May and June, 1906, must apply for admission to these examinations upon Form S 119. This form will not be received after the 28th February.

Should a sufficient number of applications be received, arrangements will be made to hold examinations in Dublin, Belfast, Cork, London-derry, Limerick, Waterford and Galway, and, in very exceptional circumstances, when application has been made by School Managers before the 28th February, arrangements may be made for examinations at other centres.

First Class successes at the examinations in Drawing on the Blackboard, which will be conducted by Inspectors of the Department on behalf of the Board of Education (South Kensington) during the months of April, May and June, 1906, will be accepted towards the Irish Secondary Teachers' Drawing Certificate.

REGULATIONS FOR THE CONDUCT OF THE LOCAL EXAMINATIONS IN SUBJECTS OF SCIENCE AND ART CONDUCTED BY THE DE-PARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND ON BEHALF OF THE BOARD OF EDUCATION (SOUTH KENSINGTON).

1. The examinations are held in the evenings in April, May and June, and in the day-time in June: the dates on which the examinations in the various subjects will be held are specified in the Examination Time Table, published separately.

Candidates may not present themselves for examination in the same subject at the evening examinations and at the day examinations in the same year.

Candidates may not present themselves for examination in more than one stage or section of a stage of any subject in the same year except in (a) Mathematics, in which subject they may take either one stage in each of the two groups of stages into which the examination in this subject is divided, or Honours in Division I. and Division II. of Mathematics; and (b), Agricultural Science and Rural Economy, in

which subject they may take the examination in one of Sections A, B, C, and one of Sections D, E, and F of Stage 2. As Stage 1 of Subject VIII. (Sound, Light, and Heat) is common to the three sub-divisions into which the subject is divided for the advanced stages, candidates who take Stage 1 are not eligible to take, in the same year, Stage 2, Stage 3, or Honours of any of the three sub-divisions of the subject. When examinations are held concurrently in several subjects on the same evening, no candidate may take more than one of such subjects.

2. Examinations in Practical Chemistry (Subjects Xp, and XIp.), and in Practical Metallurgy (Subject XIXp.), are held only in laboratories equipped in accordance with the requirements appended to the Board of Education's Syllabuses for these subjects. Where the number of candidates for examination working at the same time exceeds the number for which the laboratory is approved, the candidates may be examined in divisions. Not more than two such divisions will be allowed, and the number of candidates in each division working at the same time must not exceed the number for which the laboratory is approved.

Practical examinations for candidates in Honours in certain subjects may be held at South Kensington, or at some other centre, in addition to a written examination. Such practical examinations will be held as early as possible in June or July. Candidates who are instructed to attend these examinations at South Kensington or any other centre, receive a subsistence allowance of 7s. 6d. a night while required to be absent from home, and third-class railway fare; but no cab or omnibus fares are allowed.

3. Examinations in Drawing on the Blackboard will be held by Inspectors of the Department during the months of April, May and June, at approved centres. Applications for these examinations from Schools and Classes must be forwarded to the Department, on Form S. 135, on or before the 28th February.

As a rule no school will be made a centre of examination unless ten candidates are to be presented, but the Department will consider representations to hold examinations at schools which do not comply with this regulation.

4. The grades of success at the Examinations are "first-class" and "second-class."

Exceptions.—(1) In Section 1 of Stage 1 of Science Subjects XV. and XXIII. there is only one grade of success, viz.: "pass."

- (2) In the Art subjects of Drawing and Modelling from the Life and Architectural Design there is a further grade of success, viz.: "excellent."
- 5. Applications for examination papers in Stage 1 of Science Subjects, and in Stage 1 of Design cannot be considered unless the application is accompanied by a sum of 1s. 6d. for each such paper asked for. For papers in Stage 1 of Practical Chemistry or Practical Metallurgy the fee will be 2s. 6d. per paper. No fee is exigible in respect of examinations in subjects of Art other than that in the Stage 1 of Design.

The number of papers requisitioned cannot be subsequently varied, and no part of the remittance is returnable.

The remittance of the fee for papers in Stage 1 must be made by Bank Draft, Cheque, or Postal Order, made payable to "The Accountant, Department of Agriculture and Technical Instruction for Ireland." Stamps cannot be accepted.

- 6. Managers of Schools who wish to present candidates for the local Science and Art examinations must provide accommodation, and propose to the Department arrangements for the examination of their students. The Department, however, reserve to themselves the right to revise the proposed arrangements, and to amalgamate the examinations in any district should they think it expedient.
- 7. External candidates (i.e., candidates who are not students of any school or class) must apply to the Department not later than the 24th February for Form S 101, upon which to make application for examination, and must then state whether they wish to take the evening or the day examinations. The special regulations as to the admission of external candidates to these examinations are printed separately upon Form S 100, copies of which may be had upon application.

Students of schools or classes must apply for examination through their Managers.

The Department will assign external candidates to a centre for examination and managers of schools at which examinations in a given subject are being conducted must admit such candidates to examination in that subject, on the authorisation of the Department, in such numbers as the Department, having regard to the available accommodation, may deem reasonable. Due regard will be had to the nature of the institution at which the examination is to be held when assigning external candidates to any centre.

- 8. Where managers of different institutions have classes in the same subject under their control they must arrange, where possible, for a conjoint examination of these classes in such manner that an unnecessary number of rooms may not be in use.
- 9. A separate examination will not, as a rule, be held where the number of candidates to be presented in any one subject is less than four, but the Department will be prepared, when in such cases the school from which the candidates come is distant from any larger centre, to consider proposals for holding a separate examination at the school.
  - 10. The accommodation provided should be as follows:-
    - (a.) For examinations in all subjects of Science and in all subjects of Art, except those mentioned in (b), the accommodation should be such as to allow of the candidates' being seated not less than five feet apart from centre to centre. For examinations in subjects of Science it is desirable that rooms with level floors and without galleries should be used.
    - (b.) At examinations in the following subjects of Art:—Freehand Drawing in Outline, Model Drawing, Drawing in Light and Shade from a Cast, Drawing and Modelling from the Antique, Drawing and Modelling from Life, Modelling the Head from Life, and Painting from Still Life, candidates may be placed so as to be not ess than two feet six inches apart from centre to centre.

- 11. Managers or their representatives must provide (for use in the examination in those subjects in which they are respectively required), ink, pens, ruled foolscap paper, pins or paper fasteners, tracing paper, and the necessary materials, such as stands, nails, &c., required for hanging up the casts for examination purposes in Drawing in Light and Shade and Modelling from the Antique.
- 12. Managers of Schools presenting students for examination must apply to the Department not later than the 24th February for Form S 102, upon which to make a return showing the number of papers required for each subject, and such other particulars as the Department may deem necessary. The return, which must be forwarded to the Department not later than the 28th February in the case of Evening Examinations, and not later than the 7th April in the case of Day Examinations, will be taken as final, and no further emendations can be allowed. Managers must state when applying for this form whether it is proposed that their students should take the evening or the day examinations.
- 13. The Managers will nominate on Form S 107, which will be issued a fortnight before the date fixed for the first examination, certain persons prepared to superintend the examinations. The superintendents may either be voluntary superintendents, or they may be remunerated by the Managers, after notice to the Department, at a rate not exceeding 2s. 6d. per hour of attendance necessary; the Department would not, however, approve of Managers making payments for such services to members of their own body. Candidates for examinations, their relatives, their teachers, or other persons who have a direct interest in the success of any candidate are ineligible to act as superintendents of examinations. Managers are held entirely responsible for the presence of superintendents to the number required at each examination, otherwise the examination may be held to be void.
- 14. The examination papers and the materials supplied by the Board of Education (South Kensington) for the examinations will be forwarded to the Examination Secretary.

The packets of examination questions must not, under any circumstances be permitted to pass into the hands of a teacher, of a candidate for examination, or of any other person interested in the success of the candidates.

If the Examination Secretary is eligible to act as Superintendent (See Section 13 above), the Managers must appoint some other responsible person to act as a custodian of Examination Papers.

- 15. Detailed instructions for the conduct of the examinations will be addressed to the Secretary and to the persons nominated as Superintendents.
- 16. The Department will issue to external candidates cards of admission to the examinations, and to the Secretary, blank cards of admission, which must be distributed amongst the candidates to be

presented for examination from his school. A candidate who is unable to produce the card of admission, may not, except in special circumstances, be admitted to the examination room.

- 17. The Department may disallow examinations which afford evidence of not having been conducted in strict accordance with the regulations; they will investigate cases of suspected irregularity, and may require any or all of the candidates to be re-examined. If any candidate should fail to appear at such investigation, or decline to be re-examined, all his previous examinations may be cancelled. When an examination has failed through no fault of the candidates, a re-examination may be allowed, the cost of which may be charged to the Managers. A re-examination will not be accepted for the purposes of Scholarships, &c.
- 18. All possible care is taken that the Examination Papers may be forwarded in accordance with the applications, and that the results may be issued correctly, but the Department cannot undertake to rectify mistakes, nor will they be responsible for any incidental loss.

[Note.—Copies of the Forms referred to above may be obtained, after the 1st January, 1906, upon application to the offices of the Department.]

Form S. 100.
Local Examinations.

# DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

UPPER MERRION-STREET, DUBLIN.

Telegraphic Address—" Resources, Dublin."

LOCAL SCIENCE AND ART EXAMINATIONS, 1906.

Regulations respecting the Admission of External Candidates to the Local Examinations in Subjects of Science and Art, conducted by the Department of Agriculture and Technical Instruction for Ireland, on behalf of the Board of Education (South Kensington).

(1.) The examinations are held in the evenings in April, May, and June, and in the day-time in June. The dates on which the examinations in the various subjects will be held are specified in

the Examination Time Table, published separately. As the number of centres at which Day Examinations are held is comparatively restricted, much difficulty is frequently experienced in finding a conveniently near centre for External candidates, who are therefore advised to arrange to sit at the Evening Examinations.

- (2.) Candidates may not present themselves for examination in the same subject at the Evening Examinations and at the Day Examinations in the same year. Candidates may not present themselves for examination in more than one stage or section of a stage of any subject of Science in the same year, except in (a) Mathematics, in which subject they may take either one stage in each of the two groups of stages into which the examination in this subject is divided, or Honours in Division I. and Division II. of Mathematics, and (b) Agricultural Science and Rural Economy, in which subject they may take the examination in one of Sections A, B and C, and one of Sections D, E and F of Stage 2. As Stage 1 of Subject VIII. (Sound, Light, and Heat) is common to the three sub-divisions into which the subject is divided for the advanced stages, candidates who take Stage 1 are not eligible to take, in the same year, Stage 2, Stage 3, or Honours of any of the three sub-divisions of the subject. When examinations are held in several subjects of Science on the same evening, no candidate may take more than one of such subjects.
- (3.) External candidates, (i.e. candidates who are not students of any school or class), must apply to the Department not later than the 24th February for Form S. 101, upon which to make application for examination, and must then state whether they wish to take the evening or the day examinations. Form S. 101 must be returned to the Department, in respect of evening examinations, before the 28th February; and in respect of day examinations, before the 7th April.

Students of schools or classes must apply for examination through their Managers.

(4.) Applications for examination in Stage 1 of Science Subjects, and in Stage 1 of Design, cannot be considered unless such application is accompanied by a sum of 1s. 6d. for each paper asked for. For papers in Stage 1 of Practical Chemistry and Practical Metallurgy the fee will be 2s. 6d. per paper. The number of papers requisitioned cannot be subsequently varied, and no part of the remittance is returnable. No fee other than this will, as a rule, be payable by external candidates, but the Department reserve to themselves the right to charge a further fee in special cases where an examination is being held solely for the benefit of external candidates, or for any other reason.

The remittance of the fee for papers in Stage 1 must be made by Bank Draft, Cheque, or Postal Order, made payable to "The Accountant, Department of Agriculture and Technical Instruction for Ireland." Stamps cannot be accepted.

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- (5.) The Department cannot undertake, unless in exceptional cases, to hold an examination in any subject for external candidates, except at places where an examination in the same subject is being held. The Department will assign external candidates to a centre for examination, but external candidates making application for admission to the examinations in Practical Chemistry, Practical Metallurgy, Drawing from Life, Architectural Design, and Modelling and Casting, must have previously made arrangements with the authorities of some school (in which an examination in these subjects is to be held) for admission to a place in the Laboratory or Art Room, and must comply with the conditions as to the supply or use of apparatus and re-agents or modelling clay imposed by those authorities, and a certificate to this effect must be forwarded along with the application for examination.
- (6.) Examinations in Drawing on the Blackboard will be held during the months of April. May, and June, at approved centres. The Department will make arrangements for the admission of external candidates to these examinations, but cannot undertake to hold a special examination for such candidates, nor will any application for examination in this subject be considered, unless Form S. 117 has been received in the offices of the Department by the 28th February.
- (7.) Cards of admission will be issued to external candidates a week before the date fixed for the first examination. A candidate who is unable to produce the card of admission will not, except in special circumstances, be admitted to the examination room.
- (8.) External candidates must provide the materials required for examination in the particular subjects which they take, e.g., Pens, Pencils, and in Art Subjects, Drawing Boards, T Squares, Instruments, Pins, Fasteners, &c.

# EXAMINATIONS IN DRAWING ON THE BLACKBOARD AND ELEMENTARY MODELLING FOR THE IRISH SECONDARY TEACHERS' DRAWING CERTIFICATE.

First Class successes at the examinations in Drawing on the Blackboard, referred to above, will be accepted towards the Irish Secondary Teachers' Drawing Certificate.

Candidates who desire to present themselves for the special examinations in Elementary Modelling, to be held in April, May, and June, 1906, must apply for admission to these examinations upon Form S. 119. This form will not be received after the 28th February.

Should a sufficient number of applications be received, arrangements will be made to hold examinations in Elementary Modelling in Dublin, Belfast, Cork, Londonderry, Limerick, Waterford, and Galway.

Note.—Copies of the Forms referred to above may be obtained, after the 1st January, 1906, upon application to the offices of the Department.

# DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

UPPER MERRION-STREET, DUBLIN.

Telegraphic Address-" Resources, Dublin."

### I.—Special Examinations for Teachers' Qualifications in Experimental Science.

The Department will hold, in 1906, special examinations for Teachers' qualifications in Experimental Science. The written tests in connection with these examinations will be held on Saturday, the 12th May, from 11 n.m. to 2 p.m. Candidates who qualify at the written examination will be admitted to a special practical examination, and provisional qualification to give instruction in the First, Second, Third, or Fourth Year Syllabuses of the Department's Programme of Experimental Science for Day Secondary Schools, will be granted to those candidates who succeed in reaching a satisfactory standard in the practical examination.

The subjects of the Special Examinations will be:

- (1.) First Year Syllabus of the Preliminary Course.
- (2.) Second Year Syllabus of the Preliminary Course.
- (3.) Physics (Third Year Syllabus of the Programme).
- (4.) Physics (Fourth Year Syllabus of the Programme).
- (5.) Chemistry (Third Year Syllabus of the Programme).
- (6.) Chemistry (Fourth Year Syllabus of the Programme).
- (7.) Mechanical Science (Third Year Syllabus of the Programme).
- (8.) Mechanical Science (Fourth Year Syllabus of the Programme).
- (9.) Botany (Third Year Syllabus of the Programme).
- (10.) Botany (Fourth Year Syllabus of the Programme).
- (11.) Physiology and Hygiene (Third Year Syllabus of the Programme).
- (12.) Physiology and Hygiene (Fourth Year Syllabus of the Programme).
- (13.) Geology.

The examination in any subject will be open only to those teachers in Secondary Schools who have received at least 100 hours' practical instruction in that subject within two calendar years previous to the date of the present examination. Before

entering upon the course of instruction each Teacher must obtain, in writing, the Department's approval of the conditions under which such instruction is to be given.

Teachers who have made satisfactory attendance at the Short Summer Courses of Instruction conducted by the Department in 1904 and 1905, and who, as a result of the examination at the conclusion thereof, failed to secure a certificate or obtained recognition to teach for one year only, will be admitted to the Special Examination in that subject without having to satisfy the Department as to attendance at further courses of instruction.

Candidates will not be permitted to sit for examination in more than one subject in any one year.

Should a sufficient number of applications for examination be received the Department will arrange to hold the written examination at Dublin, Belfast, Cork, Londonderry, Limerick, Waterford, and Galway, and, in very exceptional circumstances, other centres might be arranged for, provided that special application is made by School Managers before the 28th February, 1906.

Application for admission to the examination must be made before the 28th February, 1906, on Form S. 118, copies of which may be obtained, after the 1st January, upon application to the

offices of the Department.

II.—REGULATIONS UNDER WHICH THE DEPARTMENT ARE PREPARED TO RECOGNISE SPECIAL COURSES OF INSTRUCTION IN EXPERIMENTAL SCIENCE FOR TEACHERS IN DAY SECONDARY SCHOOLS.

The Instructor in charge of classes for Teachers must be specially qualified, and his qualifications must be approved of by the Department for the purposes of the Special Course of instruction.

The Laboratory must also be approved of by the Department for the purposes of the Special Course of instruction.

Special classes, conducted during the winter under the superintendence of a County or Urban Technical Instruction Committee, or other responsible body of Managers, may be registered as Science classes, and grants earned according to the regulations and scale of payment set out in the Science and Art Directory of 1901. For this purpose the Department would permit the First Year Syllabus of the Preliminary Course to be registered as Section 1 of Stage 1 of Physiography (Science Subject XXIII.); the Second Year Syllabus of the Preliminary Course and Chemistry (Third Year Syllabus), as Stage 1 of Inorganic Chemistry (Science Subjects X. and Xp.); Chemistry (Fourth Year Syllabus), as Stage 2 of Inorganic Chemistry (Science Subjects X. and Xp); Physics (Third Year Syllabus), as Stage 1 of Sound, Light and Heat (Science Subject VIII.); Physics (Fourth Year Syllabus), as Stage 1 of Magnetism and Electricity (Science Subject IX.); Mechanical Science (Third Year Syllabus), as Stage 1 of Applied Mechanics Subject VII.); Mechanical Science (Fourth Year Syllabus), as Stage 2 of Applied Mechanics (Science Subject VII.); Botany (Third Year Syllabus), as Stage 1 of Botany (Science Subject XVII.); Botany (Fourth Year Syllabus), as Stage 2 of Botany (Science Subject XVII.); Physiology and Hygiene (Third Year Syllabus) as Stage 1 of Hygiene (Science Subject XXV.); Physiology and Hygiene (Fourth Year Syllabus) as Stage 2 of Hygiene (Science Subject XXV.); and Geology as Stage 1 of Geology (Science Subject XII.)

It is important to note that in order to qualify for grants it is necessary that the course of instruction should begin before the 1st December; that grants may not be claimed upon account of students joining after that date; and that in order to qualify for the higher rates allowed for practical work it is necessary that at least twenty-eight lessons in the theory of the subject be given during the Session, each such lesson to be of not less than one hour's duration.

Attendance at theoretical instruction may not be taken into account when computing the 100 hours' practical instruction referred to in the third paragraph of Section 1 of this form.

Application for the recognition of special classes for Teachers must be made by letter, accompanied by detailed proposals upon Form S. 43. Attendance at lessons previous to the receipt of the Department's written approval of the arrangements may not be reckoned as part of the 100 hours' practical instruction.

Form S. 190.

## DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

UPPER MERRION-STREET, DUBLIN.

TELEGRAPHIC ADDRESS-" Resources, Dublin."

#### COMMERCIAL AND INDUSTRIAL SCHOLARSHIPS.

The Department propose to establish for the year 1905-6, Commercial and Industrial Scholarships, in accordance with the following general conditions:—

#### (a) COMMERCIAL SCHOLARSHIPS.

A number of Commercial Scholarships (not more than four) will be granted for the Session 1905-6. They will be of the value of £100 each, and will be tenable for one year only at such Schools as the Department may approve. The object of these Scholarships is to offer to young men having a sound general education (and, as far as possible, commercial experience), facilities for one year's training in some higher Institution providing approved courses of instruction, with a view to their employment as teachers of Commercial Subjects in Ireland.

Candidates must be at least twenty-one years of age.

Successful candidates will be required to enter into an undertaking that they will engage in the teaching of Commercial subjects after the termination of their Scholarships.

Candidates must fill in and return addressed to the Secretary of the Department, not later than the 6th September, 1905, Form S. 191, copies of which may be had on application.

#### (b) INDUSTRIAL SCHOLARSHIPS.

The Department propose to establish for the Session 1905-6 two Industrial Scholarships, one for persons engaged in the Woollen Industry, and one for persons engaged in the Leather and Tanning Industries. The Department will also consider applications for a third Scholarship from persons engaged in other industries.

The object of these Scholarships is to enable selected persons (who must already have been engaged in one of the higher branches of the Industry) to take a full course of instruction in an institution providing special courses of an approved character, with a view to training them for the management of such Industry. Candidates will be required to show that there is a reasonable expectation of their being able to find suitable employment in the Industry in Ireland at the close of their instruction.

The Scholarships will be tenable at some higher Institution, to be approved by the Department, in which the industry is taught. They will be of the value of £80 each, and may be renewable for second and third years at the discretion of the Department.

Candidates must apply for Form S. 192, which should be returned to the Department duly filled in not later than the 6th September, 1905.

The Scholarship holders will be selected by the Department on consideration of the qualifications and experience of the applicants.

Certificates of good character will be required from all applicants, and selected candidates will be required to produce a medical certificate of health, and an authenticated copy of Certificate of Birth.

The decision of the Department in regard to the selection of Candidates or to any other question arising out of these Scholarships will be final.

### NOTES AND MEMORANDA.

A meeting of the Board of Technical Instruction was held on Wednesday, the 26th of July, at the Offices of the Department, Upper Merrion-street, Dublin.

The following members of the Board were present:—The Right

Meetings of the Boards, &c.

Honourable Sir Horace Plunkett, P.C., K.C.V.O., F.R.S., Vice-President of the Department, in the chair; Mr. James Dempsey; Mr. Christopher J. Dunne, J.P.;

Sir Edward Fitzgerald, Bart.; Mr. William G. D. Goffe, J.P.; Sir James Henderson, A.M., D.L.; Sir Otto Jaffé, J.P.; Alderman Michael Joyce, M.P., Mayor of Limerick; Very Rev. P. J. Lally, P.P.; Mr. Alexander Taylor; Mr. Thomas H. Teegan; Mr. William J. Woodhams.

Mr. George Fletcher, F.G.S., Assistant Secretary in respect of Technical Instruction; Mr. R. Cantrell, 1.S.O., Chief Clerk; Mr. W. G. S. Adams, M.A., Superintendent of the Statistics and Intelligence Branch; Mr. W. Vickers Dixon, B.A., Senior Inspector for Technical Instruction; Mr. J. P. Walsh, Clerk in Charge of Accounts; and Mr. J. D. Daly, M.A., Senior Staff Officer, who acted as Secretary to the meeting, were also present.

The Assistant Secretary in respect of Technical Instruction explained the arrangements that had been made for the conduct of the short summer courses for teachers, for which provision had previously been made with the concurrence of the Board. He stated that the number of teachers attending the courses arranged this year was 840, as compared with 813 in 1904. The number of courses provided was 76, while the number of instructors engaged to conduct these courses was 114.

Technical Instruction schemes in respect of the Session 1905-6, for the following urban and county areas, were brought forward by the Department:—

Urban Districts:—Ballymena, Ballymeney (Joint Urban and Rural), Banbridge, Bangor, Blackrock, Galway, Holywood, Larne, Lurgan, Newry, Newtownards, Pembroke, Portadown, Sligo, Tipperary (Joint Urban and Rural), Wexford.

Counties: —Carlow, Donegal, Dublin, Kerry, Kildare, Queen's County, Roscommon, Sligo, Waterford, Wicklow.

The Assistant Secretary in respect of Technical Instruction explained the more important points of difference between the schemes submitted and those that were approved for the Session 1904-5. The schemes having been discussed, the Board concurred in the application of grants from the funds of the Department in accordance with the proposals submitted.

The VICE-PRESIDENT stated that the revised schemes for the other urban and county areas, in respect of the Session 1905-6, were being completed in consultation with the local committees concerned, and would be brought forward at the next meeting.

On the proposal of the Vice-President, the Board concurred in provision being made for additional Travelling Scholarships in commercial and industrial subjects.

A meeting of the Agricultural Board was held on Wednesday, 2nd August, at the Offices of the Department, Upper Merrion-street, Dublin.

The following members of the Board were present:—The Right Honorable Sir Horace Plunkett, P.C., K.C.V.O., F.RS., Vice-President of the Department, in the Chair; Mr. Alexander L. Clark, J.P.; Colonel Nugent T. Everard, D.L.; Sir Josslyn Gore-Booth, Bart.; Mr. Patrick J. Hogan, J.P.; Most Rev. Denis Kelly, D.D., Lord Bishop of Ross; Mr. Arthur S. Lough, J.P.; the Right Honorable Lord Monteagle, K.P., D.L.; Mr. H. de F. Montgomery, D.L.; and Mr. Patrick J. O'Neill, J.P.

Mr. J. S. Gordon, B.Sc., Chief Agricultural Inspector; Mr. R. Cantrell, I.S.O., Chief Clerk; Mr. W. G. S. Adams, M.A., Superintendent of the Statistics and Intelligence Branch; Mr. J. P. Walsh, Clerk in charge of Accounts; Mr. J. D. Daly, M.A., Senior Staff Officer (who acted as Secretary to the meeting), and Mr. J. V. Coyle, were also present.

The Board had under consideration the various Live Stock, Agricultural, and other schemes for the year 1906.

On 23rd August, at the Royal Dublin Society's Offices at Ball's

Bridge, Sir Horace Plunkett, Vice-President

Dairy Conference. of the Department of Agriculture and Technical Instruction for Ireland, and Mr. James

Scott Gordon, the Department's Chief Agricultural Inspector, met
a Committee of delegates from the various County Committees of

Agriculture and Technical Instruction. This Committee had been

originally convened by the County Committee for Kilkenny. The object of the Conference was to discuss the question of the steps to be taken for the improvement of the dairy cattle of Ireland. The VICE-PRESIDENT informed the Conference that as a result of the discussion on the subject at the recent meeting of the Council of Agriculture and of their representations, the Board of Agriculture had decided as follows:—

- (1.) That the Department should invite owners of good dairy cows, whether half-bred or pure-bred, to offer their stock for inspection both as regards general appearance and milk yield.
- (2.) That inspections for general merit might take place at local shows, local exhibitions, or at the residences of owners.
- (3.) That the owners of selected cows should be required to keep a record of the weight of milk yielded by such cows. That the owners should allow their herds to be inspected at any time, and that the Department's Inspector should be afforded every facility for testing the quality as well as the quantity of the milk of selected animals. That the owners should further undertake to have selected cows served by an approved pure-bred bull, and that the progeny should be submitted for inspection later on.
- (4.) That the Department should publish from time to time a register of selected cows which have proved good milkers. (Note.—There should be two selections—first for general appearance, and afterwards for milk yield.)
- (5.) That the progeny of registered cows should also be eligible for registration, provided they possess sufficient merit.

The Vice-President also stated that the Department had arranged to employ Mr. Patrick Clune, late Superintendent of the Albert Agricultural College, Glasnevin, as Inspector in connection with this Scheme.

A discussion ensued, in the course of which it was decided that a fee of 2s. 6d. should be charged for the registration of cows.

The scheme was then unanimously approved by the Conference.

As a result of the recent annual examination for Scholarships in
Agriculture tenable at the Royal College of
Agricultural Science, Dublin, the following candidates
Scholarships, 1905-6. have been awarded Scholarships:—William
Dods Davidson, Albert Agricultural College,
Glasnevin, Dublin; Loftus A. Bryan, junr., Borrmount Manor,

Enniscorthy; Daniel Twomey, Loughboro' House, Macroom; Thomas Hogan, Gaulstown, Rathmoyle, Kilkenny; William J. Doherty, Temple, Charlestown, Co. Mayo; Patrick M'Govern, Tullybrack, Bawnboy, Co. Cavan; Denis Collins, Albert Agricultural College, Glasnevin; James P. Drew, Donacarney, Drogheda; George N. Hunter, Albert Agricultural College, Glasnevin, Dublin.

As a result of the competition for Scholarships and Teacherships-

Competition for Science and Technological Scholarships. in-Training, held at the Royal College of Science, Dublin (see *Journal*, Vol. V., No. 2, p. 341), Scholarships have been won by:—William H. Clark, Mountjoy School, Dublin; Joseph I. Graham, St. Andrew's Col-

lege, Dublin; Patrick Cormack, Christian Brothers' Schools, Thurles; Harold R. Read, Christian Brothers' Schools, SS. Peter and Paul, Clonmel; Robert J. Smith, Mountjoy School, Dublin.

Teacherships-in-Training have been won by:—John Barrett, of Cashel; Thomas Haigh, Christian Brothers' Schools, Cork; William H. O'Connor, of Dublin; Edward J. Cuddy, Christian Brothers' Schools, Limerick; Otway H. Little, of Clonmel.

At the competitive examination for Domestic Economy Teacherships-in-Training (see Journal, January,
1905, page 343), which was held on the 4th
July, at centres in Dublin, Belfast, Cork and
Galway, there were sixty-one candidates.

The ten open Scholarships were won by:—Miss Frances C. Ledwich, of Blackrock, Co. Dublin; Miss Charlotte T. Stack, of Foxrock, Co. Dublin; Miss Mary T. Walsh, of Drinagh, Co. Wexford; Miss Kathleen O'Mara, of Bramber, Sussex; Miss Julia O'Mahony, of Macroom; Miss Sarah A. Lacy, of Cork; Miss Emily M. Parker, of Dublin; Miss Catherine Campbell, of Mountrath; Miss Lizzie O'Flynn, of Sixmilebridge, Co. Clare; Miss Elizabeth M. Brennan, of Dublin. No Limited Scholarships were awarded.

Nine candidates attended the competitive examination for these Teacherships-in-Training (see Journal, January, 1905, page 338), which was held at the Metropolitan School of Art, Dublin, on the 4th, 5th, and 6th July last. The successful candidates were:—Miss Ethel E. M. Symes, of Dublin; Mr. James E. Corr, of Dublin; Miss Meave O'Byrne, of Monkstown, Co. Dublin.

Ten applications for Industrial Scholarships (see p. 134) were received, and sixty-nine applications for Commercial and In-Commercial Scholarships (see p. 133). dustrial Scholarships. Industrial Scholarships were awarded to:

Mr. W. E. Sanderson, of Blarney, Co. Cork (Woollen Industry); Miss Margaret M. Brodigan, of Dundalk (Tapestry and Carpet Weaving); Mr. Edward Fitzgibbon, of Cork (House Decorating). Commercial Scholarships were awarded to:

Mr. Michael Waldron, B.A., of Ballyhaunis; Mr. Richard Fox, of Drogheda.

The Industrial Scholarship (Woollen Industry) awarded to Mr. Patrick J. Sheehan, of Dungarvan, has been renewed for a second session; and the Commercial Scholarships awarded last year to Mr. W. Boyd Cooper, of Castlegarren, Co. Sligo, Mr. Edward Daly, of Dublin, and Mr. W. Scott, of Drogheda, have also been renewed.

The reports of the Butter-making contests at the London Dairy Irish Successes at the Show, held last week, record very creditable performances on the part of Irish pupils. London Dairy Show. the several competitions, five Irish girls (four of them present pupils, and one a past pupil of the Munster Institute) took part, and were successful in obtaining the following prizes and honours:-In the class open to those who have never won a prize at any Show, in which there were twenty-six entries, Miss Mary O'Byrne and Miss Evelyn Mahaffy obtained the first and third prizes respectively. In the open class confined to women, in which there were also twentysix entries, Miss E. A Walsh obtained second prize, Miss A. M. Nedwill third prize, and Miss A. O'Neill was highly commended. the class open to men and women, Miss E. A. Walsh obtained the reserved ticket (fourth place), and Miss A. O'Neill was commended. In the class open to winners of first prizes, Miss M. O'Byrne was very highly commended, while in the Champion Cup contest she received a similar mark of honour.

This is the first occasion on which pupils from the Munster Institute have entered the lists at the premier Dairy Show, and their performance is all the more creditable when it is remembered that many of the other candidates had frequently taken part in similar competitions at the London and other Shows, and had thereby gained experience which gave them a considerable advantage. In the circumstances, therefore, the success of the Irish girls reflects the greatest credit, not only on themselves, but also on those who were responsible for the training given at the Munster Dairy School.

The total area under crops in 1905, according to a report\* just

Irish Crops and Herds in 1905 issued by the Department of Agriculture and Technical Instruction for Ireland, is 2,361,696 acres, being, as compared with the area in 1904, a decrease of 12,269 acres, or 0.5 per cent. There was an increase in Illuter of 3,878 acres, or 0.4 per cent.

the area under crops in Ulster of 3,878 acres, or 0.4 per cent.; a decrease in Leinster of 8,192 acres, or 1.3 per cent.; in Connaught of 4,149 acres, or 1.4 per cent.; and in Munster of 3,806 acres, or 0.7 per cent.

In 1904 the area returned under Hay was 2,260,160 acres; in 1905 the amount returned is 2,294,574 acres, being an increase of 34,414 acres, or 1.5 per cent.

In 1904 the area returned under grass was 10,586,639 acres; in 1905 the amount returned is 10,597,848 acres, being an increase of 11,209 acres; the area returned as fallow in 1904 was 9,360 acres, and in 1905, 8,903 acres; the area under woods and plantations was 303,118 acres in 1904, and 301,430 acres in 1905; and the area returned under "Turf Bog, Marshes, Barren Mountain Land, &c.," was 4,817,483 acres in 1904, and 4,786,274 acres in 1905, being a decrease of 31,209 acres; of the area thus returned in 1905, 1,081,421 acres have been entered by the enumerators as turf bog, 392,651 acres as marsh, and 2,274,238 acres as barren mountain land.

Compared with 1904 there appears an increase of 7,214 acres in the area under wheat; of 139 acres under Cereal Crops. bere; of 738 acres under rye; and of 68 acres under pease; while there was a decrease of 12,180 acres under oats; of 3,600 acres under barley; and of 418 under beans; showing a net decrease of 8,039 acres in the area under cereal crops.

The area under potatoes has decreased by 1,917 acres; that under turnips by 3,614 acres; mangel Green Crops. wurzel by 3,129 acres; carrots by 360 acres; vetches by 174 acres; and rape by 482 acres; beet root increased by 48 acres; parsnips by 11 acres; cabbage by 3,014 acres, and other green crops by 513 acres, leaving a net decrease of 6,090 acres in the area under green crops.

<sup>•</sup> Abstracts showing the Average under Crops, and the Number of Live Stock in Ireland [Od. 2713—1906].

The area under flax in 1904 was 44,293 acres; the area returned under this crop in 1905 is 46,153 acres, Flax. being an increase of 1,860 acres, or 4.2 per cent.

In the returns the area under meadow and clover is shown as the area "For Hay only," subdivided under the headings "Clover, sainfoin, and grasses under rotation" and "Permanent pasture, or grass not broken up in rotation." The area for hay under "Clover, &c.," in 1904, was 631,748 acres: this year it is 628,618 acres, being a decrease of 3,130 acres. The area for hay on permanent pasture in 1904 was 1,628,412 acres, and in 1905 it is 1,665,956 acres, showing an increase of 37,544 acres. There is, therefore, a net increase of 34,414 acres in the total area under meadow and clover.

It appears from the following Table that between 1904 and 1905 there has been an increase of 4,062 in the Live Stock.

Live Stock.

Cattle exhibit a decrease of 31,496, sheep of 78,606, and pigs of 150,804. Of the 18,548,877 poultry enumerated in 1905, 1,018,599 were turkeys, 1,714,365 were geese, 2,939,105 were ducks, and 12,876,808 were ordinary fowl.

Table showing the Number of Live Stock in each year from 1896 to 1905, inclusive:—

•	Yeai	ls.		Horses.	Mules.	Asses.	Cattle.	Sheep.	Pigs.	Goats.	Poultry
1896,	•		•	629,097	30,078	230.721	4,408,133	4,080,711	1,404,586	306,445	17,537,570
1897,	•		•	610,215	29,270	230,253	4,464,874	4,157,906	1.327.450	299,086	17,777,248
1898,			•	590,768	29.622	231,659	4,486,949	4,287.551	1,263,912	296,437	17,687,430
1899,			•	580,286	30,129	237,177	4,507,457	4,364,507	1,363,310	303,509	18.233,520
<b>19</b> 00,				<b>566,97</b> 8	30,678	242,247	4,608,550	4,386,876	1,268,521	306.078	18,547,307
1901,				<b>564</b> ,916	28,882	238,980	4.673,323	4,378,750	1,219,135	312,409	18,810,717
1902,				<i>5</i> 79,7 <b>6</b> 5	29,397	242,862	4,782,221	4,215,865	1.327,610	303,654	18,504.324
1903,				595,746	29,795	243,241	4.664,112	3,944,604	1.383,516	299,120	18.153,714
1904,	•			604,930	29,931	244,145	4,676,718	3.827,919	1,315,126	290,222	18,256,959
1905,	•	•	•	608,992	29,684	244,596	4,645,222	3,749,313	1,164,322	284,059	18,548,877
Difference is and I	bet w			Increase,	Decrease. 247	Increase,	Decrease. 31,496	Decrease, 78,606	Decrease. 150,804	Decrease, 6,163	Increase 291,918

As a result of Mr. Rider Haggard's report on the question of National Land Settlements (see Journal, Vol. V., No. 4, p. 752), a Committee has Agricultural Settlements. been appointed by the Colonial Office to consider Mr. Rider Haggard's suggestions.

The duty of the Committee will be to report to the Government whether agricultural settlements in the British Colonies can usefully be established with a view to placing in them emigrants from the great cities of the United Kingdom. The Committee is further required, by the terms of reference of the Minute by which it is constituted, to report on any suggestions germane to the general subject of emigration, which may be brought forward in the course of the inquiry. The Committee consists of Lord Tennyson (Chairman); Mr. J. S. Davy, of the Local Government Board; Mr. Bernard Holland, of the Colonial Office; Mr. Henry Lambert, of the same department; Mr. A. Wilson Fox, of the Labour Commission, Board of Trade; Mr. H. L. W. Lawson, M.P.; Colonel Llewellyn, M.A.; Mr. Herbert Samuel, M.P.; and Mr. Sidney Webb.

Training in Forestry at Oxford

The Departmental Committee appointed by the Board of Agriculture to inquire into and report upon the state of British Forestry, stated in paragraph 16 of the Report (Cd. 1319-1902):-"The desirability of a great State Forest School on the model of Nancy or of Ebers-

walde has not escaped our attention, but we do not feel justified, under present conditions, in recommending so great an outlay as would be necessitated by the creation of such an institution. We think, however, that many of the advantages of an institution of this type could be secured at a comparatively small outlay by the transference of the Forestry Department at Cooper's Hill to a University centre. This would at once place the highest form of forestry education available in this country within the reach of a large proportion of the prospective land-owners and land-agents, while the advantages to the candidates for the Indian Forest Service of three years' residence in a University are obvious. The Colonies make increasing demands on this country for qualified forest experts, and we anticipate that an increasing number of lecturers and advisory experts will be required for work in the United Kingdom. Our universities contain many students thoroughly well-grounded in natural science and economics, who, at the end of their period of study of pure subjects, would readily be attracted to the study of forestry, and would rapidly qualify as forest experts."

As a result of this recommendation, it appears from a Parliamentary Paper (Cd. 2523-1905), recently issued, that arrangements have been made for the transference of the Forestry Department from Cooper's Hill to Oxford University. In the draft memorandum of the scheme, Cambridge was designated as the best University for the purpose, on account of its more advanced teaching of science, but on further consideration it was thought Oxford better suited for the practical study of Forestry on account of the woods in its neighbourhood. The India Office has, therefore, arranged for the Professor and Assistant Professor of Forestry now engaged at Cooper's Hill to reside at Oxford, and to pay for their services. In the summer of each year nine probationers for the Indian Forest Service will be appointed, and candidates must have passed an examination equivalent to Responsions at Oxford before presenting themselves for the competitive examination to be held by the Civil Service Commissioners.

The voluminous Report on Fishing and Hydrographical investi-

### North Sea Fisheries Investigations.

gation in the North Sea and adjacent waters (Cd. 2612—1905), which has been prepared by the North Sea Investigation Committee and submitted to the Scottish Board of Fisheries, contains a mass of information

likely to prove useful not only to men of science, but also to those occupied commercially in the fishing industry. The scheme of international investigations is made up of three parts—hydrographical researches, biological observations and experiments, and statistical inquiries, and the present report is devoted chiefly to hydrographical and statistical matters.

The nations at present engaged in the work are Belgium, Denmark, Finland, Germany, Great Britain and Ireland, Holland, Norway, Sweden, and Russia. Each of these countries sends representatives to a Central Council with offices in Copenhagen, under the presidency of Dr. Walter Herwig, of Hanover, and Prof. Otto Pettersson, of Stockholm.

As each of the nations, party to the investigations, is sending

its best workers to take part in the inquiries, and as all are striving to add to our knowledge of the North and Baltic Seas, it is to be expected that results will be secured which will be of direct advantage to all those that reap the harvest of the sea.

The Report of the Estates Commissioners covering the period from the 1st November, 1903, to 31st March,

The Estates Commissioners' Report.

1905, has just been issued (Cd. 2742—1905).

It appears that in that period 2,085 applications, originating proceedings by vendors for the sale of estates to persons other than the Land Commission, were lodged, and, by the end of March, 1905, the lands comprised in 1,443 of these 2,085 applications had been provisionally declared fit to be regarded as "Separate Estates" for the purposes of the Act.

The number of agreements for purchase of holdings lodged in cases of sales of estates to persons other than Sales of Estates. the Land Commission in the period under review was 41.629, the purchase money being £16,666,999. For the purchase of parcels (Sec. 2) 463 agreements were lodged, the purchase money being £94,236. For the purchase of demesnes 16 agreements were lodged, the purchase money being £134,896.

The purchase of 15 estates was completed by the Land Commission for £163,926, the total amount realised on resale being £139,752, but 137 acres of tenanted and 1,639 acres of untenanted land remained unsold. Owners desiring to repurchase demesnes or lands in their occupation were 113, the acreage being 44,480; of these applications 24 resulted in agreements, the price being £156,528. Three estates were certified as congested but had not been dealt with. In 13 cases offers made by the Commissioners to purchase estates in the Land Judge's Court were accepted, the purchase money being £157,928, but there were 72 applications under this heading. No advances were made for the purchase of untenanted lands, though negotiations were pending in 21 cases, the average being 5,277 acres.

In cases of direct sales, 42,117 applications for advances amounting to £16,828,994 were received from the commencement of the Act.

Twenty-nine agreements (based on proposed resales to 2,181 purchasers, for sums amounting to £691,561),

Summary of Applications.

were entered into with vendors for the sale of estates under Section 6, and the Land Judge accepted the offers of the Land Com-

mission to purchase 13 estates under Section 7, such offers being based on proposed resales to 334 purchasers amounting to £156,618.

The above sums amount to £17,677,173. In addition, there were, on the 31st March, 1905, offered for sale to the Commissioners estates of an estimated value of £2,085,957, and estates in respect of which the Congested Districts Board had transmitted requests to the Land Commission under Section 79, of the value of £382,°40—making a-total to the end of the period under review of £20,145,370.

Nine thousand and twelve advances, amounting to £4,610,143

### Summary of Advances.

were made in respect of direct sales and resales under Sections 3, 6, and 7, and cash payments amounting to £42,920 were made by purchasers to complete their purchase

money. In addition, advances amounting to £42,911 were made for the purchase of estates and portions of estates where resales had not taken place, making the total amount advanced £4,653,054.

In the period up to 31st March, 1905, applications had been received from 4,626 persons describing them-

#### Evicted Tenants.

as evicted tenants or their representatives. Of these applicants, 115 appeared, on the

face of the applications, to be outside the purview of Section 2, ss. 1 (d) of the Act, either having been evicted more than twenty-five years previous to the passing of the Act, or not having been tenants of holdings to which the Land Law Acts apply; 135 resided, at the time of the receipt of the particulars, outside Ireland, viz.:—88 in America, 5 in Australia, 1 in Africa, 41 in England, Scotland, or Wales.

From the applications it appears that, at the date thereof, the former holdings of the applicants were, in 3,214 cases, in the occupation of tenants, while in the remaining 1,412 cases they were in the landlords' hands or let to graziers on the eleven months' system.

Purchase agreements or undertakings have been lodged with the Estates Commissioners in respect of 101 tenants reinstated or proyided with other holdings by landlords on estates which had been

inspected up to 31st March, 1905, and 50 evicted tenants were reinstated by the Commissioners on estates actually purchased by them in that period. In addition, on estates which the Commissioners have agreed to purchase, 41 evicted tenants, or their representatives, have been reinstated, and the Commissioners have under consideration the restoration of others on estates for the purchase of which under Sections 6, 7 and 8 of the Act, they are at present negotiating. The Commissioners have also been informed of the reinstatement by landfords of 46 evicted tenants whose purchase agreements have not up to the present been lodged, or, if lodged, the estates on which the holdings are situated have not yet been inspected. There are probably other cases of the reinstatement of evicted tenants by landlords, as well as on estates purchased by the Congested Districts Board, or sold by the Land Judge otherwise than under the provisions of Section 7 of the Act, which had not come to the notice of the Commissioners.

As a supplement to the articles which have already appeared in this journal dealing with cement manufacture (see Vol. III., No. 2, p. 221 et seq. and p. 249 et seq., and Vol. V., No. 4, p. 64, et seq.), the following extract from Mr.

Consul-General Hertslet's Report (Cd. 2682—26—1905) on the Trade of Belgium will be of interest to cement manufacturers. Although the exports of minerals from Belgium increased considerably in 1904, and the mineral trade is principally composed of cement, the exports of Belgian-made cement declined from 599,091 tons in 1903 to 588,295 tons in 1904, the respective values for the two years being £623,040 and £564,762. The exports to the United Kingdom show an increase of 11.6 per cent. in volume and of 2.6 per cent. in value, the figures for 1904 being 231,213 tons, of a value of £221,964. From the above figures it would appear that the average value of exported cement is somewhat below £1 per ton.

The following table shows the chief countries to which Belgian cement was exported, and from this it will be seen that while large amounts are sent to the United States of America, the Netherlands, Brazil, Argentine Republic and other countries, the amount exported to the United Kingdom far exceeds any of these, and comprises alone more than one-third of the total exports.

PRINCIPAL EXPORTS of Belgian Cement during the years 1903-01.

Country.			190	03.	1904.		
			Quantity.	Value.	Quantity.	Value.	
			Tons.	£	Tons.	£	
United Kingdom,	•••		208,159	216,486	231,213	221,961	
Argentine Republic,	•••		34,389	35,765	38,290	36,758	
Cape Colony	•••		22,907	23,822	14,148	13,581	
Canada,	•••		29,718	30,906	15,278	14,667	
Brazil,	•••		26,754	27,824	32,675	31,363	
Egypt,	•••		8,491	8.831	15,321	15,708	
Mexico,	_		27,601	28,703	24,952	23,953	
Netherlands,	***		51,308	53,360	58,599	<b>56,25</b> 5	
Spain,	•••		14,038	14,600	14,912	14,315	
United States of Amer	ica,		90,137	93,742	66,659	63,993	

The average prices for cement during 1904 continued to be very low and the profit to manufacturers was but small. Orders for "Portland cement" of Belgian manufacture were unremunerative, but they have during the present year been gradually improving, owing to an understanding which has been arrived at between the

### A new Syndicate.

German and Belgian manufacturers. A syndicate was recently formed between the manufacturers of Belgium, Germany and the Netherlands, which is to remain in force

for nine years from January 1, 1905. This combination of manufacturers appears to have had a very favourable effect on the price of cement in Belgium, which has been very low for a number of years, but which now shows every sign of a steady improvement. The prices quoted for Belgian cement are still below those of Germany and the Netherlands, and it is, therefore, very probable that the exports of Belgian cement will show a satisfactory increase by the end of 1905.

The following figures for the first five months of 1905, compared with the same period of 1904, seem to bear out the forecast of a large increase for the year 1905:—

	ONTH.			Quantity.			
	OAIII.	•	1.	1901.	1905.		
				Tons.	Tons.		
January,	•••	•••		19,375	28,482		
February,	•••	•••		35,332	50,426		
March,	•••	•••		38,160	50,251		
April,		•••	•	35,874	, 59,939		
May,	•••	•••		60,974	68,862		

While referring in particular to Belgian "Portland cement," it may be useful to call attention to the practice of manufacturers in that country of describing Belgian cement as Portland cement. This practice of conspicuously marking cement of Belgian origin with various British trade descriptions is carried out in great detail, and many trade-marks of Belgian cement, printed in English, may be seen in connection with the export of cement from Belgium to South Africa and to other countries, including the United Such marks as "Castle Brand," with the words "Special Quality, trade-mark," are of common occurrence, and practically all large quantities of cement are labelled in plain characters in the English language, with the obvious result of leading purchasers to believe that the goods they are buying are at least to some extent British. There is no doubt that the object of Belgian manufacturers in marking their cement in this way is to dispose of cement inferior to the Portland cement made in the United Kingdom, as a substitute for genuine British-manufactured Portland cement, at a reduction of a few shillings on the English prices. It is true that the barrels, or bags, of cement are invariably marked "Made in Belgium," but this does not warrant the use of the English language in describing the goods manufactured in Belgium, especially in view of the fact that the English descriptions and trade-marks are far more conspicuous than the inscription "Made in Belgium" placed on the barrels.

off in comparison with the year 1903, the decline amounting to 47,655 tons and £555,520, the figures for 1904 being 189,846 tons, valued at £3,022,600. The decrease in the exports is largely due to the diminished quantity of glass of all kinds sent to the United Kingdom, the United States of America, Japan, Canada, Denmark and Egypt. The decrease in the exports to Japan was very marked, the falling-off amounting to nearly two-thirds of the total exports to that country in 1903.

The exports of glass from Belgium showed a considerable falling-

This dulness in the glass export trade is due to the smaller output of the factories owing to a general strike in the industry in the early part of 1904, and a consequent cessation of the glass

supply. Orders have been placed more freely since the month of June in the present year (1905), and prices are keeping up to a fair standard, particularly in regard to special qualities of glass exported to Japan, China and Canada. The trade with the United Kingdom is not, however, very prosperous, and the lack of orders from that quarter has necessitated the lowering of prices for certain qualities of glass.

The actual prices quoted in June of this year were as follows:--

			Pı	ice.
		-	From-	То-
<b>300</b> -foot	cases,		£ s.	£ s.
"	"	3rds,	1 8	1 10

The state of the relations between masters and men is still somewhat strained, and at any moment a slight misunderstanding might cause a break in the present arrangements.

With regard to the plate-glass industry, the orders placed became somewhat more numerous towards the middle of the year 1904, owing to rumours of an intended amalgamation of the European manufacturers, and during July of the same year Belgian makers had booked orders for several months in advance. In August, 1904, an international syndicate was formed for the avowed purpose of regulating the price of plate-glass in the different countries of Europe and of restricting production. This syndicate comprises many of the plate-glass works of Belgium (including the Courcelles works, which had been bought by an American firm) of Germany, France, the United Kingdom, Italy, Austria-Hungary and the Netherlands, each company doing its own selling. The syndicate has an office at Brussels, which controls the general conditions of the alliance. Since the formation of this syndicate prices have gone up about 25 per cent., and have still an upward tendency. The prices fixed for Belgian produce are considered to be very satisfactory for the manufacturers.

A memorandum and a series of statistical tables (House of
Commons White Paper, No. 301—1905),
Tea and Coffee
Consumption.

The principal countries of Europe, in the
United States, and in certain British
Colonies, has been issued by the Board of Trade. The following
statement shows what has been the per
Tea.

\*\*capita\* consumption of tea during the five years 1899-1903 in the principal countries of

Europe and in the United States: -

Years.		Russian Empire.	German Empire.	Holland.	France.	United States.*	
	lb.	lb.	lb.	16.	lb.	lb.	
	5.95	0.79	0.11	1.39	0.05	0 98	
	6.07	0.83	011	1.48	0.06	1.09	
	6.16	0.92	011	1.20	0.02	1:14	
	6.08	0 97	0.15	1.48	0.02	0.84	
	6.03	0.94	0.11	1.45	0.08	1:30	
		5:95 6:07 6:16 6:06	1b. 1b 5:95 0:79 6:07 0:93 6:16 0:92 6:06 0:97	1b. 1b. 1b 5:95 0:79 0:11 6:06 0:97 0:12	1b. 1b. 1b. 1b. 1b 6:95 0:79 0:11 1:39 6:06 0:97 0:12 1:48	1b.     1b.     1b.     1b.     1b.        5·95     0·79     0·11     1·39     0·05        6·07     0·93     0·11     1·48     0·06        6·16     0·92     0·11     1·50     0·05        6·06     0·97     0·12     1·48     0·05	

<sup>\*</sup> For years ended June 30.

From the above will be seen that in the United Kingdom over 6 lbs. of tea per head of the population are consumed yearly. The consumption per head has remained practically stationary for the last five years, but increased by about 1 lb. per head in the preceding ten years. There is no European country where such a per capita consumption is approached. Indeed, there is no other European country, with the exception of Holland, where the consumption of tea exceeds 1 lb. per head. In Russia and in the United States, which are the other two large tea-consuming countries, the consumption amounts to about 1 lb. per head; in France the total quantity of tea consumed is under 2,500,000 lbs. or '06 of a lb. per head of the population; and in Germany it is under 7,000,000 lbs., or '11 of a lb. per head of the population. There is, however, a considerable consumption of tea in Australia, New Zealand, and Canada, and although the total quantity consumed is much smaller than in the mother country, the per capita consumption is large.

The following table shows the consumption of coffee per head of the population during the five years 1899-Coffee.

1903 in the principal countries of Europe and in the United States:—

	Years.		United King- dom,	Ger- many.	Holland.	Belgium.	France.	Austria- Hungary.	United States.
			lb.	lb.	lb.	lb.	lb.	lb.	lb.
1899,		•••	0.71	6.50	19.57	10.70	4.62	2.04	10.79
1900,			0.71	ช 28	16.57	8.65	4:64	2.05	9.81
1901,	•••	•••	9.76	6.65	18:56	10.56	4.76	2.15	10.60
1902,			0.68	6:53	23 04	10.08	4.83	2.13	13:37
1903,		•••	073	6.83	14:39	7:41	6.27	2.21	10.79
Annu: 1899	al Aver -1903.	rage,	0'71	6:19	18'42	948	5.02	2.11	11.07

In considering the above figures it must be remembered that coffee is free of duty in Holland, Belgium, and the United States. It will be seen that these three countries are those where the consumption per head is the largest, Holland having an average consumption per head of over 18 lbs., the United States an average of 11 lbs., and Belgium an average of 9½ lbs. In Germany the consumption has remained fairly steady at between 6 and 7 lbs. per head. France in most recent years has imported less than 5 lbs. per head of population for consumption, and Austria-Hungary rather over 2 lbs. per head. The consumption per head in the United Kingdom does not reach 3 lb.

According to the Diseases of Animals Report for the year 1904

[Cd. 2609—1905] recently issued by the

Diseases of Animals

in Ireland. Instruction for Ireland, the list of maladies

liable to be dealt with under the Diseases of

Animals Acts in Ireland was, by the addition of Epizootic Lymphangitis, increased in number to eleven, and stood at the close of the year as follows:—Cattle Plague, Foot-and-Mouth Disease, Pleuro-Pneumonia, Anthrax, Sheep Pox, Sheep Scab, Swine Fever, Rabies, Glanders or Farcy, Parasitic Mange, Epizootic Lymphangitis.

The history of the year is, however, concerned with no more than six of these diseases, as Cattle Plague, Foot-and-Mouth Disease, Pleuro-Pneumonia, and Sheep Pox have, respectively,

been unknown in Ireland for long periods past, and there has been no recorded case of Rabies in the country since 1903.

The extent to which outbreaks of those scheduled diseases actually present among live stock in Ireland in 1904 were recorded as regards the different classes of animals is shown by the subjoined table, which also affords means of comparison under the same heads with the preceding year:—

Kind of Animals.	Total Number of each kind of Animals in Ireland in 1904.	Scheduled Diseases to which such Animals are liable.	Number of Outbreaks of each Dis- case among such Animals in the year	Total Number of each kind of Animals in Ireland in 1908.
			1904. 1903	
Cattle,	4,676,718	Cattle Plague, Foot-and-Mouth Disease, Pleuro-Pneumonia, Rabies, Anthrax,		4,864,112
Sheep,	3,827,919	Foot-and-Mouth Disease, Rabies, Anthrax, Sheep Pox, Sheep Scab, Sh	486 655	3,944,604
Swine,	1,315,126	Foot-and-Mouth Disease, Swine Fever, Rabies, Anthrax,	181 176	1,383,516
Goats,	290,222	Foot-and-Mouth Disease, . Rabies, Anthrax,		299,120
Horses, Asses, and Mules.	879,006	Rabies, Epizootic Lymphangitis, Anthrax, Glanders or Farcy, Parasitic Mange,	1 - 11 5 162 195	808,782
Dogs,	455,840	Rabies,	_ 2	448,750
	11,444,831		845 1,036	11, <b>608</b> ,884

Turning to a consideration of recent legislation affecting the
Live Stock industry, the Orders issued in
Ireland under the Diseases of Animals Acts
during 1904 numbered six. Two of these,
entitled respectively—

The Animals (Transit and General) (Ireland) Amendment Order of 1904, and

The Epizootic Lymphangitis (Ireland) Order of 1904, were of more than ordinary importance. The former, apart from the general provisions embodied therein, contains in its transit sections a number of new regulations having for their main objects the further improvement of the conditions of carriage of stock by railway, and the prohibition of transit either by rail or water of

cows too near calving, or of animals unfit from any other cause to be carried. The latter Order schedules under the Diseases of Animals Acts, and prescribes precautionary regulations in respect of Epizootic Lymphangitis, a disease of horses, asses, and mules, unknown in Ireland until the year 1903, but of which various cases, traceable to the influx of army horses at the conclusion of the South African campaign, have since occurred in this country.

The shipments of cattle, sheep, and swine from ports in Ireland to Great Britain and the Isle of Man, though

The Irish Cattle reaching the substantial aggregate of over two million head, were decidedly less in volume in 1904 than the previous year, and

also below the average for the past ten years, vide the subjoined figures:—

Averag		otal, innual	exp	orts	for	nast	ten	2,020,037
Swine,	•	•	•	•	•	•	•	
Sheep, Swine,	•	•	•	٠	•	•	•	741,593 505,247
Cattle,						•		773,197

The causes of such a fluctuation are difficult to determine. The principal factors may have been—

- (a) General trade depression, tending temporarily to reduce the market purchases of fat stock; and
- (b) A not unnatural reaction from the specially brisk demand that had existed for store animals in the years 1902 and 1903.

As compared with 1903, the horse exports exhibit a slight reduction, but they are at the same time, as the following figures show, appreciably above the low level touched in 1902—

Year.					Horses exported to Great Britain and Isle of Man.
1902,		•	•		. 25,318
1903,					. 27,836
1904,					. 27,622

Exports of animals other than cattle, sheep, swine, and horses are comparatively insignificant in their total, and do not call for any general comment. It may, among other things, be noted that a new British port, Heysham, was opened during the year for the reception of animals from Ireland. In the period from the date of such opening to the end of the year close on 46,000 animals were shipped thereto from the ports of Belfast, Dublin, and Londonderry.

A report (Cd. 2637—1905) just issued by the Board of Agriculture gives details of the operation

The working of the
Fertilisers and Feeding Stuffs Acts
during 1904. The returns received from ing Stuffs Act, 1893, in England.

Fertilisers and Feeding Stuffs Act, 1893, show that in 1904 samples taken under the

Act were analysed in 78 counties and boroughs of Great Britain. This is an increase on the number for 1903, when only 69 counties and boroughs took samples. There are still, however, 10 counties in England and Wales, and 9 in Scotland, which took no action during the year. The number of samples taken was 1,440.

The Departmental Committee appointed in 1903 to enquire into the working in Great Britain of the Fertilisers and Feeding Stuffs Act of 1893, continued their enquiries till the close of 1904, and the Report was not signed till the beginning of 1905. Meanwhile it was not thought desirable to press on local authorities generally the Board's view with regard to the administration of the Act, except when special opportunity arose. Such a case occurred in connection with the administration of the Act in the Lindsey Division of Lincolnshire, where considerable activity was displayed in the last quarter of 1903 in taking samples under the Act. Inspectors took samples in the first place for information only, and they refrained from prosecuting except where they were satisfied that the seller was guilty of habitual, or intentional, offences. adopting such a policy the local authority carry farmers with them, and succeed in executing the Act better than where, by excess of zeal in prosecuting, they cause alarm and alienate the farmers, on whom they are dependent, and who then refuse to allow samples to be taken. The obvious advantage of such a course led the Board to issue a Circular Letter to local authorities pointing out the excellent results obtained, and suggesting that similar action should be taken elsewhere.

Representations are made from time to time that the present law as to sale of agricultural seeds is inadequate, and further legislation is urged. The Board incline to the view expressed by the Departmental Committee on Agricultural Seeds in their Report (Cd. 489) published in 1901, where it is stated: "Many witnesses expressed a desire to see some alteration in the law, but your Committee were unable to elicit any suggestions which did not appear

to them either to be covered by the law as it at present stands or to be undesirable or impracticable." An opportunity for testing this presented itself in March, 1904. Owing to the abnormally wet weather of the previous year, very little good clover seed of British origin was at that time in the market. Considerable quantities of foreign seed were sold in England, of a bright appearance, but of inferior quality and full of impurities, including Chilian Dodder. The Board's attention was drawn to one case in which some seed alleged to be Canadian was sold as English, the word "Somerset" being used in such a way as to imply native origin. On the recommendation of the Board, the Public Prosecutor took out a summons under the Merchandise Marks Act of 1887, and on the case coming before the magistrate the defendant, who pleaded guilty, was fined £10, with 6s. court fees and £21 towards the cost of the prosecution.

A tolerably good supply of fish and low prices were the chief characteristics of the Spring Mackerel Fishery

Spring Mackerel of 1905. The total catch shows a falling Fishery, 1905. off, resulting from the stoppage of fishing at many places when prices fell below what the fishermen considered to be remunerative. The amount landed

at Kinsale, however, was about 400 tons more than in 1904, and prices there, on the whole, kept to a fair level; while on the Galway coast the "engaged" prices were in favour of the fishermen.

The total landings at those stations from which spring mackerel fishing was prosecuted amounted to 228,050 cwt., the money value of which was £50,540.

Owing to the bad prices paid in England for fresh mackerel, an exceptionally large proportion of our fish was cured for the American market—the number of barrels thus treated being 12,672, compared with 3,027 in 1904. A special feature of this branch of the trade was the arrival of a Norwegian steamer at Cleggan, Co. Galway, in the month of June, with twenty-five expert women and other curers from Norway, who set to work curing for the American market. The presence of this steamer put the local prices up, and those fishermen who had not laid up their boats profited by the unexpected market thus provided.

The chief causes of the low prices that prevailed for fresh mackerel were the steady supply of fish of all sorts which nowadays

pours into the English markets, and especially the new development of steam mackerel fishing from Milford Haven. Up to the middle of June over 4,900 tons of mackerel had been landed at that port, compared with 2,900 tons in 1904—the period of operations being about the same in both years. Thus the mackerel sent from Ireland had to meet the competition not only of that coming from Cornwall, but of the catch by the Milford steam drifters. Whether the success of these latter was sufficient to justify a continuance of the experiment next season, remains to be seen.

Telegraphic information of the progress of the fishing was collected and despatched through the Fisheries Branch of the Department to all important centres twice each week during the season; and the following notes are based on the information thus obtained.

At Kinsale the fishing commenced with small quantities during the first week of April, in favourable Some Local Results. weather, the price being 30s. a hundred, and the fish "patchy," but no considerable quantity was taken until the month was well advanced, when the number of boats employed reached eighty, the prices rising to 35s. per hundred. The first two weeks of May were the most successful period, 14,071 and 10,206 boxes being landed, The average catch per boat, per night, was highest during the first week of May, when it reached 68.9 boxes, with fifty-one boats working on four nights. This figure is greatly above that of any week in the previous three years. Towards the middle of the month the market became glutted, and the number of boats that went out fishing dropped The boats began leaving for home about the middle of June, and the season ended at the end of that month.

At Baltimore, the season began during the week ending 22nd April, when sixty boats, fishing on three nights, landed 1,622 boxes, or an average of 9.0 boxes per boat per night. In this and the succeeding weeks want of wind caused the catches to be extremely light, but during the first three weeks of May, with improved weather conditions, over 27,000 boxes of mackerel were taken, the average per boat per night being 42.1, 32.2, and 32.8 boxes. The number of boats employed—namely, from fifty to sixty—remained throughout the season fairly uniform. Fishing ceased at the end of June.

At Castletownbere about ten boats began fishing in April, but the weather was unfavourable, and the catches insignificant. It was not until the first week of May that substantial takes—namely, 2,815 boxes—were landed, by sixteen boats, as a result of five nights' fishing, the average per boat per night being 35.2. During the week ending 3rd of June this average reached 44.1 boxes. At the latter end of May as many as thirty-six boats were working from this port, but the numbers subsequently declined rapidly to the end of the season, which was on the 1st of July.

At Valentia, fishing started in the middle of April, and was very unsatisfactory during that month. In May the fleet amounted to fifty-nine boats, which, during the first week of that month, landed 5,263 boxes, an average of 22.4. This average during the first week in June reached 33.5 boxes. Although nearly all the boats fishing from Valentia were able to shoot their nets during the greater part of each week, the results were poor, as compared with previous seasons. The boats left for home about the 1st of July.

At Fenit, the season was marked by a large decrease in the number of boats employed. This number was never higher than thirty-six, as compared with sixty in the previous two years. This is largely accounted for by the fact that steam drifters, which were in the habit of fishing from this port, were this year engaged in fishing from New Milford. The best week was that ending on the 27th of May, when 5.377 boxes were landed by twenty-four boats on five nights; an average of 44.8 boxes. The succeeding week produced an average of 27.8 boxes, and the season ended in the middle of June, the general results being disappointing.

At the Arran Islands as many as thirty-two boats were at one time employed, the best weeks being the first three of May, when average catches of 13.8, 18.0, and 17.2 boxes were landed. The weather throughout the season was favourable, from the point of view of there being sufficient wind to take the boats to the grounds, but was considered too harsh to be favourable to the presence of fish in quantities. The season practically ended in the middle of June.

Considering the returns from these stations as a whole, the first week in May showed the best results. During that week 38,320 boxes were landed by 233 boats, an average catch of 34.4 boxes per boat per night. The next best week was that ending 13th May, when 29,557 boxes were taken. The week ending on the 3rd of June produced an average of 23.3 boxes. The average of 34.4 boxes was the highest in any week during the last two years.

Particulars of the fishing will be found on pp. 170-173.

The amount of herrings captured during the summer fishing of

Summer Herring Fishery, 1905. 1905 showed a falling off of over 22% compared with that of the previous season; but as the prices in some of the more important stations were very good, the decline in the

fishermen's receipts was not in the same ratio, the value of the relative catches having been £37,375 (1905) and £43,725 (1904). Perhaps the most pronounced failure took place at the Kinsale fishery, in which forty-six Scotch boats (including four steam drifters), five Irish, and one Manx took part. The money realized there was only £1,238. In the previous year it was £4,677. change is to be attributed more to bad prices than to an absence of fish-for while the quantity landed fell only from about 9,000 cwts. to about 7,000 cwts., the average value dropped from about 10s. to about 3s. 6d. per cwt. On the Donegal coast the reverse of this occurred. There the catch of summer herrings showed a great falling off. At Downing's Bay, the principal of the Donegal stations, little over half the quantity for 1904 was landed this season, but, owing to good quality, and consequent high prices, the actual money realized (viz., £11,981), was greater. In Lough Swilly these conditions were even more pronounced. The catch was 50 per cent. less, while the money was 70 per cent. more than in 1904. There was a falling off in the herring fishery from Howth; but most of the other important stations fairly maintained the level of the previous season.

The system of telegraphic intelligence, for some time now in operation in connection with the spring mackerel fishery, has been extended to the herring fishing. Information relating to the captures, prices, number of boats fishing and to other matters was exchanged semi-weekly between the principal ports. These telegrams revealed the following points of interest:—

At Howth the fishing was commenced by one Scotch boat in the middle of May, quality being fair; but it Some Local Results. was not until the last week of June that preparations were made for the heavy fishing. At that time seven Scotch boats and twenty Irish boats had assembled. The general quality of the fish was unsatisfactory until the latter end of July, when the quantities taken also improved. During the last two weeks of that month 1,082 and 420 mease were landed. There is no interval between the summer

and winter fishings at this port. The greatest number of boats employed at any one time was sixty-nine, and the prices, when the quality improved, reached as much as 30s. per mease. The main feature of this fishery was the very mixed quality of the fish landed, many of the English boats using mackerel nets.

At Dunmore East the fishing, which is carried on entirely by Scotch boats, commenced during the last week of April, when twenty-three boats were engaged. During May the number of boats had increased to fifty-six, and considerable quantities of fish were taken throughout that month. The prices varied from 7s. to 19s. per mease. Fairly heavy fishing continued until the end of June, when the Scotch boats left. The fish throughout the season proved variable, both of quality and size, and consequently prices rose and fell sharply from day to day, as much as 30s. per mease being at one time realised.

At Helvick Head small quantities of fish were landed by the local boats during May and June, and realised from 14s. to 20s. per mease.

At Kinsale, where the fishing is principally carried on by Scotch boats, the season commenced in the middle of May, when the quality was very poor, so much so that on several nights no fishing took place, as no market was to be found. During the latter end of May the quality of the fish improved, the price rising to 11s. per mease, and eventually in the middle of June reached 20s. per mease. The Scotch boats left this port about the 14th June.

At Downing's Bay, forty boats, including a number of Scotch ones, started fishing during the first week in May, but it was not until the end of the month, when ninety boats had assembled, that any quantity of fish was taken. The price at that time was about 50s. per cran. The week ending 27th May was most successful, on one night 520 crans being landed by sixty boats, and realising 73s. per cran. With a decreased catch prices reached 87s. in June, and the season practically closed during the second week of that month.

At Buncrana fishing commenced on the 9th May, and eighty boats landed 480 crans, which realised 35s. per cran. At the latter end of this month the price reached 80s. per cran, with improved quality of fish. The weather throughout the season, which ended in the middle of June, was most favourable, and the quality of the fish towards the end of the season excellent, on Friday, the 9th June, an average price of 95s. per cran being realised.

At Ardglass the season commenced on the 3rd May, when ten boats took fifty-nine mease of fair quality, the price realised being 8s. 6d. During May the quantities landed were satisfactory, and the quality improved at the end of the month—the fish realising 13s. During June the quality still further improved, prices reaching 25s., but it was not until July that large quantities were landed—on the third week of this month 1,233 mease being taken by forty boats. Throughout nearly the whole season the weather was most favourable. The number of boats employed never exceeded fifty at any one time.

At Kilkeel one boat started fishing during the first week of May and landed a few mease, which realised 22s. 6d. per mease, but it was not until the end of that month that any number of boats were employed. Throughout June fair quantities were taken, the quality being good and prices as high as 20s. In July the largest quantities were taken, but prices dropped sharply to as low as 8s. 6d., although the quality was still reported as very good. At this station the weather throughout the season generally was very favourable.

Particulars of the fishing will be found on pp. 174-178.

The third of these competitions (see Journal, Vol. V., No. 3, pp. 536 et seg), took place on the 27th July. Surprise Butter Exhibits were received from 108 creameries. Competitions, 1905. The judges were four in number, consisting of representative butter merchants of Belfast, Dundee, Glasgow and Manchester. On the recommendation of the judges prizes were awarded to the undermentioned competitors: -Ballintrillick Co-operative Agricultural and Dairy Society; Castlecor Dairy Co.; Dromore Co-operative Agricultural and Dairy Society; Centenary Creamery Co.; Mitchelstown Creamery (Newmarket Dairy Co.); Muckalee Co-operative Agricultural and Dairy Society; Derrygonnelly Co-operative Dairy Society; Bansha Cooperative Agricultural and Dairy Society; Greencastle Co-operative Agricultural and Dairy Society; Belleek Co-operative Agricultural and Dairy Society; Finn Valley Co-operative Agricultural and Dairy Society: Knockulty Creamery (Newmarket Dairy Co.); Solohead Co-operative Agricultural and Dairy Society.

The fourth competition took place on the 10th August. Exhibits were received from 114 creameries. The judges were four in number, consisting of representative butter merchants of Buxton, Cork, London, and Manchester. On the recommendation of

the judges prizes were awarded to the undermentioned competitors:—Glenwilliam Co-operative Dairy Society; Freemount Dairy Company, Ltd.; Solohead Co-operative Agricultural and Dairy Society; Ballyrashane Co-operative Agricultural and Dairy Society; Finn Valley Co-operative Agricultural and Dairy Society; Grantstown (Co-operative Wholesale Society) Creamery; Omagh Co-operative Agricultural and Dairy Society; Castlecaulfield Co-operative Agricultural and Dairy Society; Doons Co-operative Agricultural and Dairy Society; Longford Co-operative Agricultural and Dairy Society; Moneymore Co-operative Agricultural and Dairy Society; Shaneragh Co-operative Agricultural and Dairy Society; Clouncagh Co-operative Dairy Society; Granagh Co-operative Dairy Society; Killen Co-operative Dairy Society.

The fifth competition took place on the 21st September. Exhibits were received from 108 creameries. The judges were four in number, consisting of representative butter merchants of Colchester, Leith, Limerick, and Reading. On the recommendation of the judges prizes were awarded to the undermentioned competitors: -Bansha Co-operative Agricultural and Dairy Society; Ballyrashane Co-operative Agricultural and Dairy Society; Inver Co-operative Agriculture and Dairy Society; Kilmallock Creamery Co. (Proprietary); Grantstown (Co-operative Wholesale Society) Kiltoghert Co-operative Agricultural Creamery; Bridge (Co-operative Wholesale Bunkay Creamery; Doons Co-operative Agricultural and Dairy Society; Longford Co-operative Agricultural and Dairy Society; Castlecaulfield Co-operative Agricultural and Dairy Society; Centenary Cooperative Creamery Co., Ltd.; Derrygonnelly Co-operative Dairy Society; Glenwilliam Co-operative Dairy Society; Newmarket Creamery (Newmarket Dairy Co.); Clouncagh Co-operative Dairy Society; Drumholm Co-operative Agricultural and Dairy Society; Ballintrillick Co-operative Agricultural and Dairy Society; Bride Valley Creamery (Newmarket Dairy Co.); Feale Bridge (Co-operative Wholesale Society) Creamery; Howardstown Dairy Co.; Piltown Co-operative Agricultural and Dairy Society; Shaneragh Cooperative Agricultural and Dairy Society.

The sixth competition took place on the 5th October. Exhibits were received from 105 creameries. Representative butter merchants of Belfast, Cardiff, Glasgow and Liverpool, acted as judges. On the recommendation of the judges prizes were awarded to the

undermentioned competitors:—Centenary Co-operative Creamery Co., Ltd.; Kilmallock Creamery Co. (Proprietary); Newcastle West Co-operative Agricultural and Dairy Society; Kiltoghert Co-operative Agricultural and Dairy Society; Grantstown (Co-operative Wholesale Society) Creamery; Howardstown Dairy Co.; Newmarket Creamery (Newmarket Dairy Co.); Ardagh Co-operative Dairy Society; Ballinamore Co-operative Agricultural and Dairy Society; Ballybricken (Co-operative Wholesale Society) Creamery; Bansha Co-operative Agricultural and Dairy Society; Mitchelstown Creamery (Newmarket Dairy Co.); Ballinahinch (Co-operative Wholesale Society) Creamery; Longford Co-operative Agricultural and Dairy Society; Spamount Co-operative Agricultural and Dairy Society.

STATISTICAL TABLES.

### FISHERY STATISTICS-

# STATEMENT of the Total QUANTITY and VALUE of the FISH returned compared with the

		North	Coast.			East	Coast.		
_	1905.		19	1904.		1905,		004.	
	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan-	Value.	
	Cwta.	£	Cwts.	£	Cwts.	£	Owts.	£	
Brill,					15	18	36	128	
Soles,	14	48	15	84	84	373	68	357	
Turbot,			2	2	40	116	8	51	
Total Prime Fish,	14	48	17	86	139	507	112	536	
Cod,	9	3	20	16	516	472	531	475	
Conger Eel,					300	354	568	261	
Haddock,	417	170	185	48	390	391	948	906	
Hake,					457	749	976	1,004	
Herrings,	2,055	2,409	5,763	4,061	6,776	3,020	10,843	4,014	
Ling,					474	453	235	98	
Mackerel,	13	1	312	23	33	13		.	
Plaice, ,	271	201	709	562	579	642	G40	829	
Ray or Skate, ,	75	19	160	41	315	206	481	130	
Sprats,			.					.	
Whiting,	.				769	6 <b>6</b> ŏ	858	474	
All other except Shell Fish, .	83	63	190	48	2,179	1,093	1,887	789	
Total,	2,937	2,917	7,356	4,888	12,957	8,565	18,079	9,516	
SHELL FISH:—	No.	i	No.		No.		No.		
Orabs, •	6 577	35	3,229	15	16,456	143	17,088	87	
Lobsters,	5,418	164	3,178	109	5,955	238	6,577	273	
Mussels.	Cwta.		Cwts. 1,540	10	Cwts.	3	Cwts. 270	10	
	No.		No.		No.		No.		
Oysters, ,	G	•		•		•		.	
Other Shell Fish,	Cwts.		Owts.		Cwts. 673	291	Cwta. 360	125	
Total,		199		184	•	675		495	
Total Value of Fish landed, .		8,116		5,022		9,240		10,011	

IR ELAND.

as landed on the Irish Coasts during the month of June, 1905, as corresponding period in 1904.

	South	Coast.			West	Coast.		Total.				
19	05.	19	04.	19	05.	19	04.	18	05.	19	04.	
Quan- tity.	Value.	Quan-	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	
Owts.	£	Cwts.	£	Cwts.	£	Cwts.	£	Cwts.	£	Cwts.	£	
2	3			24	38	66	109	41	59	102	237	
39	174	27	128	134	415	182	658	271	1,010	292	1,227	
2	5	2	6	59	191	75	232	101	312	87	291	
43	182	29	134	217	644	323	999	413	1,381	481	1,755	
341	230	139	85	19	10	107	35	885	715	797	611	
71	47	152	87	3	2	7	3	374	403	727	351	
112	51	69	36	206	92	225	107	1,125	701	1,417	1,097	
33	30	11	16			30	13	490	779	1,017	1,033	
16,561	3,926	15,317	<b>5</b> , <b>6</b> 95	16	9	1,154	329	25,408	9,361	33,107	14,099	
462	337	193	110	<b>3</b> 9	20	49	18	975	810	477	226	
24,356	4,717	41,662	7,069	21,015	4,878	38,167	7,309	45,917	9,609	80,141	14,401	
180	172	149	146	381	267	471	315	1,411	1,285	1,969	1,852	
70	9	86	11	16	4	27	6	506	238	754	191	
151	55	103	36	598	216	332	136	1,518	936	1,293	646	
595	222	410	135	1,025	411	1,173	403	3,882	1,789	3,660	1,375	
43,475	9,978	58,310	13,560	23,535	6,553	42,065	9,673	82,904	28,013	125,840	37,637	
No. 2,086	14	No. 793	6	No. 1,033	9	No. 560	4	No. 26,152	201	No. 21,670	112	
10,214	309	7,498	261	20,919	604	5,462	155	42,506	1,315	22,715	798	
Owts.		Owts. 285	3	Cwts.	•	Owts.		Cwts.	3	Cwts. 2,095	23	
No.		No.		No.	-	No.		No.		No.		
Owte. 190	19	Cwts. 160	16	Owta. 530	80	Owts. 770	130	Owts. 1,893	390	Owts. 1,290	271	
	812	•	286		693	•	289	•	1,909	•	1,204	
	10,320		13,50		7,246		9,962		29,922		38,811	

correction in the Annual Returns.

### FISHERY STATISTICS-

# STATEMENT of the Total QUANTITY and VALUE of the Fish returned compared with the

		North	Coast			East	Coast.	
	190	<b>)</b> 5.	190	)4.	190	15.	190	)1,
	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.
MARKET CONTROL OF THE PROPERTY	Cwts.	£	Cwts.	£	Cwta.	£	Cwts.	£
Brill,					14	14	22	94
Soles,	7	24	9	58	111	483	67	506
Turbot,					22	69	17	89
Total Prime Fish, .	7	24	9	58	147	566	106	689
Cod,			_		359	315	638	398
Conger Eel,	2	1			234	202	410	183
Haddock,	74	32	59	12	213	291	981	842
Hake,			١.		209	320	807	759
Herrings,	3	1			22,159	6,394	15,880	6,946
Ling,					244	213	188	78
Mackerel,	100	42	31	8	647	202	145	48
Plaice,	262	204	559	470	605	669	591	<b>6</b> 82
Ray or Skate			51	15	296	154	737	164
Sprats,					١.			
Whiting,					552	474	807	437
All other except Shell Fish,	81	39	194	47	2,795	1,432	1,964	791
Total,	529	313	906	610	28,460	11,232	23,234	12,017
SHELL FISH:-	No.		No.		No.		No.	
Crabs,	10.545	44	5,876	19	28,586	229	28,731	120
Lobsters,	17,679	490	10,859	249	12,026	173	8,723	506
Mussels,	Cwts.		Cwts.		Owts. 274	28	Owts.	2
	No.		No.		No.		No.	
Oysters,						•	•	
Other Shell Fish,	Cwts.	1	Cwts.	.	Owts. 642	251	Owts. 378	129
Total,		535		268		981		757
Total Value of Fish landed,		878		878		12,218		12,774

NOTE.—The above figures are subject to

as landed on the IRISH COASTS during the month of July, 1905, as corresponding period in 1904.

IRELAND.

	South	Coast.			West	Coast.			T	otal.	
19	06.	19	04.	19	05.	19	04.	19	05.	19	04.
Quan- tity.	Value.	Quan- tity.	Value								
Owts.	£	Owts	£	Cwts.	£	Owts.	£	Cwts.	£	Cwts.	£
5	10	14	7	33	48	52	73	52	72	83	1
51	237	35	162	163	490	151	454	332	1,234	262	1,1
3	12	2	8	45	132	55	184	70	213	74	:
59	259	51	177	241	670	258	711	451	1.519	124	1,6
71	47	18	10	64	22	23	11	494	384	679	
68	29	35	13	4	2	28	7	308	234	473	
7	7			60	39	90	60	354	369	1,130	
12	5	7	6	65	30	259	182	286	<b>3</b> 55	1,073	1
20	8	95	42	292	119	131	78	22,474	6,522	16,086	7,
114	62	9	6	12	4	18	8	370	279	215	
7,273	1,636	14,155	2,326	6,234	1,908	7,298	1,579	14,254	3,848	21,629	3,9
141	139	207	249	473	381	692	529	1,481	1,393	2,049	1.5
2	1	•		43	10	23	5	341	165	814	1
131	22	70	7			45	7	131	22	115	
40L,	129	168	85	<b>6</b> 10	216	331	123	1,563	819	1,306	•
1,133	526	1,588	1,377	1,731	688	1,399	454	5,740	2,685	5,145	2,6
9,432	2,870	16,403	4,278	9,829	4,149	10,595	3,754	48,250	18,591	61,138	20,6
No.		No.		No.		No.		No.		No.	
8,768	28	2,954	19	1,547	13	1,184	11	47,386	314	38,745	1
22,462	641	11,096	324	33,189	842	13,697	878	85,356	2,446	44,375	1,4
Owts.		Cwta.	•	Cwts.		Cwts.		Cwts. 274	28	Cwts.	
No.		No.		No.		No.		No.		No.	
Cwts. 150	15	Cwts. 190	19	Cwts. 617	108	Owts. 376	52	Owts. 1,415	375	Owts. 989	2
•	684	•	362		963	•	441		3,163	•	1,8
•	3.564		4,640		6.112		4,195		21,757		22,4

correction in the Annual Beturns.

### FISHERY STATISTICS-

STATEMENT of the TOTAL QUANTITY and VALUE of the FISH returned as compared with the

			North	Coast.			East	Coast.	
		19	05.	19	04,	19	05.	19	04.
		Quan- tity.	Value.	Quan- tity.	Value	Quan- tity.	Value.	Quan- tity.	Value.
		Cwts.	£	Owts.	£	Cwts.	£	Owts.	£
Brill,						16	15	17	87
Boles,		5	14	20	103	110	410	120	504
Turbot		б	7			28	114	19	114
Total Prime Fish,		10	21	20	103	151	639	156	705
Cod.	:	190	67	20	100	543	493	620	466
Conger Eel,				·	·	378	259	626	454
Haddock .	•			74	16	273	376	537	479
Hake.			•	13	10	454	677	697	527
Herrings,		575	225	290	104	13.837	4,770	13,993	5,500
Ling,				2,50	101	505	445	177	83
Mackerel,		59	40	199	46	5,571	764	2 898	856
Plaice,		421	314	1,034	619	5,571	643	880	872
Ray or Skate,		5	2	4	2	365	209	979	189
Sprats,			_	*	_	900	209		
Whiting,			•			632	569	610	380
All other except Shell Fish,	•	145	62	229	85	1,989	985	1,954	822
an once cacope mon risin, e	•					1,000		1,001	044
Total, .	,	1,405	721	1,850	1,005	25,284	10,729	24,157	11,333
SHELL FISH:		N7-		37		<u>,,</u>			
Crabs,		No. 15,168	58	No. 13,258	29	No. 28,314	197	No. 29,780	114
Lobsters,		17,311	451	19,847	491	10,025	419	15,807	579
35		Cwts.		Cwts.		Owts.		Cwts.	
Mussels,	•	•	•		•	208	18	178	15
Oysters, . , .		No.		No.		No.		No.	
Other Shell Fish, .		Cwts.		Cwts.	2	Owts. 650	250	Cwts. 532	183
Total,		•	509	•	525		884	•	891
Total Value of Fish la	nded,	•	1,230	•	1,530		11,613	•	12,224

NOTE—The above figures are subject to

1RELAND.

landed on the IRISH COASTS during the Month of August, 1905, as corresponding period in 1904.

	South	Coast.			West	Coast.			T	otal.	
19	05.	19	01.	19	05.	19	04.	19	05.	190	) <b>4</b> .
Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value,	Quan- tity.	Value
Owts.	£	Cwts.	£	Cwts.	£	Cwts.	£	Owts.	£	Öwts.	£
6	14	5	5	32	46	34	58	54	75	56	15
63	274	64	255	175	577	149	466	353	1,275	363	1,33
4	14	5	15	49	157	52	181	86	292	76	31
73	302	74	275	256	780	235	701	493	1,642	485	1,79
26	16	3	1	2	1			761	567	623	40
31	11	32	12			9	4	409	270	667	4
8	4			33	21	83	54	314	401	694	5
85	80	371	219	37	14	328	152	576	771	1,396	8
1,170	356	505	209	6,438	2,057	1,529	619	22,020	7,408	16,317	6,4
23	18			12	6			540	469	177	1
2,571	789	5,930	1,226	2,072	743	6,696	1,409	10,273	2,336	15,723	3,5
232	207	277	261	298	249	460	343	1,534	1,413	2,651	2,1
7	3			44	10	39	8	421	224	1,022	19
99	11	709	137				•	99	11	709	1:
349	136	372	192	251	101	214	74	1,232	806	1,226	6
753	383	1,493	509	1,262	<b>537</b>	1,256	421	4,149	1,967	4,932	1,8
5,427	2,316	9,766	3,011	10,705	4,519	10,849	3,792	42,821	18,285	46,622	19,17
No.		No.		No.		No.		No.		No.	
3,520	31	2,001	15	1,010	8	589	5	48,012	294	45,628	16
7,674	226	11,249	320	18,613	490	24,414	<b>83</b> 5	5 <b>3</b> ,653	1.586	71,317	2,22
Cwts.		Owts.		Cwts.		Owts. 31	3	Cwts. 208	18	Owts. 209	. 1
No.		No.		No.		No.		No.		No.	
Owta 132	15	Owts. 170	17	Owts. 660	103	Cwts. 369	74	Cwts. 1,342	368	Owts. 1,077	27
	272	•	352	•	601	•	917		2,266	•	2,68
	2,588	•	3,393		5,120		4,709		20.561		21,80

correction in the Annual Returns.

## SPRING MACKEREL FISHING,

No.	Places where Fish are landed.	Collecting Stations.	Date when Fishing may be said to have commenced.	Date when Fishing may be said to have ended.	Quantity captured.	Total approximate Value.
1	Dunmere East.	Dunmore East,		_	Cwts. 7,751}	£ g. d. 433 18 1
2	Dungarvan,	Helvick Head,	-	_	993	93 3 0
3	Youghal,	Youghal,	-	_	434	49 18 0
4	Ballycottin,	Ballycottin,	26th April,	28th June,	1,206	217 15 0
5	Queenstown,	Queenstown,	4th April,	22nd June,	1,114}	423 6 0
6	Kinsale,	Upper Cove,	lst April,	30th June,	55, <b>0</b> 02}	12,926 10 6
7	Union Hall and	Union Hall,	8th April,	30th June,	13,510	2,528 3 0
8	Glandore. South Reen and	Castletownsend	7th April,	28th June,	8502	167 12 0
9	Castletowns- end. Baltimore,	Baltimore,	22nd April,	30th June,	40,524	8,730 13 4
10	Schull and Cape	Schull,	13th May,	30th June,	1,904	357 0 0
11	Clear. Castletown	Castletown	18th April,	30th June,	10,658}	2,030 11 0
12	Berehaven. Garinish and Dursey.	Berchaven. Garinish and Dursey.	18th April,	28th June,	1,917	565 15 0
13	Tranferla and Ballydonegan.	Ballydonegan,	No break since last	30th May,	544	159 14 0
14	Ballycrovane, Urhan, and Travarra.	Ballycrovane,	Autumn. 3rd March,	16th June,	1,5471	381 9 0
15	Rineen and	Waterville,	1st April,	20th June,	1,000	250 0 0
16	Derrynane, Ballinskelligs, Boolakeel, Dungagon, Allahe nemore, Boat Cove, and Ren-	Ballinskelligs,	30th March,	29th May,	1,240	310 0 0
17	Portmagee,	Portmagee,	3rd May,	16th June,	9612	241 16 0
18	Knightstown and Renard	Knightstown,	11th April,	:0th June,	28,891	7,790 6 3
19	Point, Cahirciveen, Cooseroom,	Cahirciveen,	20th April,	30th June,	8983	244 17 0
20	and Coonana. Dingle and Ballymore.	Dingle,	29th April,	30th June,	1,2132	290 8 6
21	Dunquin,	Ventry,	15th April,	May.*	700	210 0 0
22	Smerwick, Ballinrannig, Dooneen, and Ballydavid.	Smerwick,	March,	31st May,	1,9021	683 8 0
23	Brandon Creek,	Brandon Creel.	4th May,	16th June,	1,500	475 0 0
24	Brandon Bay,	Brandon Bay	4th May,	16th June,	1,2591	350 0 0

Owing to good price for lobsters

1905. (TABLE No. I.)

-	,						
	Number of Steamers carrying the Fish to England.	Number of Ice Hulks.	Number of Tons of Ice Imported.	Number of Barrels of Fish cured for Ex- portation.	Rate of Harbour Dues, &c.	Observations.	No,
	1	_	-	25	_	No regular mackerel tishing.	1
	_	_	-	_	_	Do. do.	2
		_	-		_	Do. do.	3
	_	_	_	_		_	4
	- 5	2	2,500	1,235	d. per registered ton, and 1d. per ton deep water quay rate. 10s. paid in advance.	_	5 6
				2,143	- paid in advance.		7
		_	_	160			8
				200			
	5	4	1,000	1,135	10s. per annum, paid at end of season.	_	9
	1	-	-	126	-	_	10
	4	1	450	1,954	_	731 cwts., value £235s.0d. landed in February.	11
	-	-	_	148	_	602 cwts., value £213 12s., landed in January and February at Garinish and Dursey.	12
	-		-	160	_	514 cwis., value £144 8s., landed in January and	13
	-		-	76	_	February. 1234 cwts., value £33 10s., landed in January and	14
	-	-	-	60	_	February.	15
	-	-	_	-			16
	-	_	-	207		38 cwts., value £12 16s., landed in January and February.	17
	1	5	1,003	2,536	_	53 cwts., value £44, landed in January.	18
	-		-	120	_	317 cwts., value £125 10s, landed in January and	19
		_	_	About 500	5s. a year per boat.	February.	20
	_	_		_	_	_	21
	-	-	-	_	2s. per boat per annum,	878 cwts., value £414 5s., landed in January and February.	22
	<b>-</b>	-	_	-		5234 cwts., value £174 7s.,	23
	-	-	-	About 500		landed in January and February. 1394 cwts., value £75, landed in January and February.	24
1			l	}			

mackerel fishing closed early.

## SPRING MACKEREL FISHING,

No.	Places where Fish are landed.	Collecting Stations.	Date when Fishing may be said to have commenced.	Date when Fishing may be said to have ended.	Quantity captured.	Total approximate Value.	
25	Fenit,	Fenit,	13th April,	19th June,	Cwts. 15,010	£ s. d. 3,5 <b>33 19</b> 9	
26	Kilkee,	Kilkee,	13th May,	17th June,	634	107 5 6	
27	Killaney Bay, .	North Arran,	30th April,	28th June,	10,908	2,366 4 10	
28	Roundstone,	Roundstone,	18th April,	30th June,	5,567	1,250 0 0	
29	Clifden, Dun- loughan, and	Clifden,	15th May,	20th June,	750	187 10 0	
30	Bunowen. Cleggan,	Clogga <b>n</b> ,	11th April,	30th June,	11,425	2,343 5 10	
31	Belderrig, Por- turlin, and	Belderrig,	20th April,	29th June,	2,400	250 0 <b>0</b>	
32	Portacloy. Rathlacken, Kilcummin,	Kileummin,	23rd May,	30th June,	2,000	220 0 0	
33	and Dock. Downies,	Mulroy,	_	_	408	33 16 0	
				Total,	226,528	50,203 3 7	

<sup>\*</sup> Not wholly employed

### SPRING MACKEREL FISHING

## Mackerel were also landed at the places set forth below,

Collecting Station.	Places where landed.	Quantity.	Value.	Observations.	
Howth, Ballinacourty,	Howth, Dungarvan,	Cwts. 331 1421	£ s. d. 12 10 0 13 16 0		
Bantry,	Bantry,	63	36 14 0	30 cwts., value £18 16s. 0d., landed in January and February.	
Ross,	Ross and Kilbaha,	12	580	Landed in January and	
Tullig,	Tullig,	341	4 19 0	February.	i
Coosheen,	Farrahy,	601	960	271 cwts., value £5 17s. 0d., landed in February.	
Seafield,	Seafield and Caher-	491	11 15 0		
Ballaghaline,	rush. Ballaghaline,	164	600	_	
Galway,	Galway,	42	20 0 0	All landed in January,	
Clew Bay,	Westport and Car- rowkeeran.	97	28 2 0	<del>_</del>	

1905. (TABLE No. I.)—continued.

Number of Steamers carrying the Fish to England.	Number of Ice Hulks.	Number of Tons of Ice Imported.	Number of Barrels of Fish cured for Ex- portation.	Rate of Harbour Dues, &c.	Observations.	No.
1	3	1,154	109	10s, for sailing boats, 30s. for steam drifters—for senson.		25
		_	10	веляон. —	711 cwts., value £22, landed in February.	26
1	2	450	814	-	landed in February.	27
3*	1	119	558	_	_	28
_		_	102	_	·. –	29
	1	500	504	. <del>.</del> .	4794 cwts., value £225 6s., landed in January and February. A Norwe- gian steamer, with curers, &c., arrived and cured about 100 barrels	30
-				<b>-</b>	for Norway.	31
-	-	-		-	_	32
		_	-	-	No regular mackerel fishing.	<b>3</b> 3
			12,672			

carrying fish.

1905. (TABLE No. II.)

which are not included in the foregoing Return.

Collecting Station.	Places where landed.	Quantity.	Value.	Observations.
	Achilbeg,	Owts. 161	£ s. d. 28 17 0	_
,	Keel, Doongh, and Keem.	187	43 4 2	
Beimuliet, Bullsmouth,	Relmullet, Achill Sound,	222 40	57 7 6 10 0 0	15 cwts., value £7 10s. 0d., landed in February.
Mullaghmore,	Mullaghmore,	23	4 6 0	
Inver,	Inver and Port,	20	600	~
Killybegs,	Killybegs,	161	3 16 0	
Teelin,	Teelin and Cladna-	217	11 18 0	· —
Buncrana,	geeragh. Buncrana,	116	22 14 0	25 cwts., value £10, landed in February.
	Totals,	1,5224	336 12 8	

### SUMMER HERRING

No.	Coast Guard Station.		Ports or Creeks from which the Fishing was carried on.	Places at which the Boats discharged their Fish,	Date when Fishing may be said to have commenced.	
1	Howth, .	•	Howth,	Howth,	10th May, .	
2	Dunmore East, Ballinacourty,		Dunmore East,  Landed by boats not belonging to Sta-	Dunmore East, .	30th March,	
3	Helvick Head,	•	tion, Dungarvan Bay, .	Dungarvan, .	6th May, .	•
4	East Ferry,	٠	Queenstown, .	Queenstown, .	19th April, .	
5	Upper Cove,		Kinsale,	Kinsale,	let May, .	
6	Castletownbere,	•	~	Bantry and Castle- townbere.	February, .	
7	Ballinskelligs,	•	Ballinskelligs, Boola- keel, Horse Island, Renroe Point, Al- lagheenmore, Boat Cove, and Dunga- gon.	Ballinskelligs, Boola- keel, Renroe Point, Boat Cove, and Dungagon.	15th February,	
8	North Arran,	•	Kilronan,	Kilronan,	1st February, .	
9	Teelin, .	٠	Teelin,	Teelin and Cladna- georagh.	February, .	
10	Burtonport,	•	Burtonport,	Burtonport and Tory Island	Мау,	
11	Mulroy, .		North of Sheephaven,	Downies Pier, .	lst May, .	
12	Buncrana, .		Buncrana,	Buncrana, .	3rd May, .	
13	Moville, .		Lough Foyle,	Moville,	February, .	
14	Cloghy, .		Portavogie,	Portvogie,	13th May, .	
15	Portaferry,		Portaferry and Kir- cubbin.	Portaferry,	2nd February.	
16	Ardglass, .		Ardglass,	Ardglass,	4th May,	
17	Kilkeel, .		Kilkeel,	Kilkeel Harbour, .	9th May, .	
18	Clogher Head,	•	Clogher Head, .	Clogher Head, .	4th June, .	

FISHING, 1905. (TABLE No. 1.)

Date when Fishing may be said to have ended.	Quantity landed.	Value.	Quantity cured for Exportation.	Quantity sold for Local Consumption.	No.
	Cwts.	£ s. d.			
31st July,	6,174	2,706 14 0		-	1
4th July, .	25,389	5,162 12 9	3,515 barrels and 1,300 mease kippered.	600 mease.	2
17th June, .	4184	124 3 0	-	All.	3
16th June, .	644]	244 16 0	· <b>-</b>	One-third.	4
17th June, .	6,9954	1,238 12 6	-	One-eleventh.	5
February, .	1,251	<b>2</b> 67 19 6	_	_	6
15th June, .	1,300	400 0 0		Two-thirds.	7
6th March, .	839	214 17 6	47 barrels	_	8
June,	8171	263 1 6	160 barrels,	-	9
May,	980	425 16 6	270 barrels,		10
20th June, .	12,001 }	11,981 18 6	494 barrels and 8,582 half barrels.	6 crans.	11
10th June, .	5,840	4,450 13 3	106 barrels, and 3,019 half barrels.	-	12
February, .	497	106 10 0	_	_	13
31st July, .	8,926	1,019 0 0	_	One-fourth.	14
31st July, .	375	90 0 0	_	One-eighth,	15
do.	19,269	5,561 15 6		One-third.	16
do	6,5772	2,081 7 0	_	About five-sixths.	17
30th July, .	4864	153 14 9		A11.	18
	93,781	36,493 12 3	-		

### SUMMER HERRING

1   Howth,   All   July, .   60   -	No.	Coast Guard Stations,	Quantity despatched to distant markets for sale as fresh Fish.	Places where the Herrings were cured.	Month in which greatest Quantity captured.	Usual number of Irish large Fishing Vessels (1st or 2nd Class) em- ployed.	Number of Irish Row Boats (not Canoes or Curraghs) employed.
Ballinacourty.	1	Howth,	All,	_	July, .	50	-
Ballinacourty	2	Dunmore East, .	3,884 mease, .	and Passage	June, .	5	-
4       East Ferry,       Two-thirds,       —       May,       —       —         5       Upper Cove,       Balance,       —       May,       5       —         6       Castletownbore,       All,       —       February,       —       —         7       Ballinskelligs,       One-third,       —       February,       —       18         8       North Aran,       Balance,       Kilronan.       February,       —       —         9       Teelin,       —       April,       10       —         10       Burtonport,       —       About 25 cwts.       Edernish,       May,       —       42         11       Mulroy,       —       —       Downies,       May,       —       42         12       Buncrana,       One-third,       Buncrana,       May,       —       —         12       Buncrana,       One-third,       Buncrana,       May,       —       —         13       Moville,       —       All,       —       —       February,       —       —         14       Cloghy,       —       Balance,       —       July,       6       —         <	3 €	Ballinacourty, .	_	East.*	June, .	14	
5       Upper Cove,       Balance,       —       May,       5       —         6       Castletownbere,       All,       —       February,       —       —         7       Ballinskelligs,       One-third,       —       February,       —       18         8       North Aran,       Balance,       Kilronan.       February,       30       —         9       Teelin,       —       April,       10       —         10       Burtonport,       About 25 cwts.       Edernish,       May,       —       42         11       Mulroy,       —       Downies,       May,       —       35       —         12       Buncrana,       One-third,       Buncrana,       May,       —       —         12       Buncrana,       One-third,       Buncrana,       May,       —       —         13       Moville,       All,       —       February,       —       —         14       Cloghy,       Balance,       —       July,       17       —         15       Portaferry,       Balance,       —       July,       58       —         16       Ardglass,       Balance,	l	Helvick Head, .	]				
6 Castletownbere, All,	4	East Ferry, .	Two-thirds, .	_	Мау, .	-	-
7       Ballinskelligs, . One-third,	5	Upper Cove, .	Balance, .	-	Мау, .	5	-
8       North Aran,       Balance,       Kilronan.       February,       30       -         9       Teelin,       April,       10       -         10       Burtonport,       About 25 ewts.       Edernish,       May,       -       42         11       Mulroy,       -       Downies,       May,       -       -       -         12       Buncrana,       One-third,       Buncrana,       May,       -       -       -         13       Moville,       Ail,       -       February,       -       -         14       Cloghy,       Balance,       -       July,       17       -         15       Portaferry,       Balance,       -       July,       6       -         16       Ardglass,       Balance,       -       July,       58       -         17       Kilkeel,       Balance,       -       July,       18       -	6	Castletownbere,	ли,	-	February,	-	-
9 Teelin, — Toelin, . April, . 10 — 10 Burtonport, . About 25 cwts. Edernish, . May, — 42 11 Mulroy, — Downies, . May, 35 — 12 Buncrana, . One-third, . Buncrana, . May, . — — 13 Moville, . All, — February, — — 14 Cloghy, Balance, . — July, . 17 — 15 Portaferry, . Balance, . — July, . 6 — 16 Ardglass, . Balance, . — July, . 58 — 17 Kilkeel, Balance, . — July, . 18 —	7	Ballinskelligs, .	One-third, .		February,	-	18
10       Burtonport,       . About 25 cwts.       Edernish,       . May,       . —       42         11       Mulroy,       . —       Downies,       . May,       . 35       -         12       Buncrana,       . One-third,       . Buncrana,       . May,       . —       -         13       Moville,       . All,       . —       February,       -       -         14       Cloghy,       . Balance,       . —       July,       . 17       -         15       Portaferry,       . Balance,       . —       July,       . 6       -         16       Ardglass,       . Balance,       . —       July,       . 58       -         17       Kilkeel,       . Balance,       . —       July,       . 18       -	8	North Aran, .	Balance, .	Kilronan	February,	30	-
11       Mulroy,	9	Teelin,	-	Toelin, .	April, .	10	-
12 Buncrana, One-third, Buncrana, May, ————————————————————————————————————	10	Burtonport, .	About 25 cwts.	Edernish, .	Мау, .	- :	42
13       Moville, All,	11	Mulroy,	-	Downies	Мау, .	35	-
14       Cloghy, Balance,	12	Buncrana, .	One-third, .	Buncrana, .	May, .	-	-
15       Portaferry,       Balance,       -       July,       6       -         16       Ardglass,       Balance,       -       July,       58       -         17       Kilkeel,       Balance,       -       July,       18       -	13	Moville,	Ail,	-	February,	-	-
16 Ardglass, . Balance, . — July, . 58 — 17 Kilkeel, Balance, . — July, . 18 —	14	Cloghy,	Balance, .		July, .	17	-
17 Kilkeel, Balance, . — July, . 18	15	Portaferry, .	Balance, .	-	July,	6	-
	16	Ardglass, .	Balance, .	-	July, .	58	-
18 Clogher Head, . — July,	17	Kilkeel,	Balance, .		July, .	18	-
	18	Ologher Head, .	-		July, .	-	-

' Kippered.

FISHING, 1905. (Table No. 1)—continued.

Number of Canoes or Curraghs em-	Number of Steam Drifters that fished from Ports	Number of Irish Row Boats using Seine or	No. of long usua	Herring ing to I lly fishe	g boats reland v d off St	not be-, which ations.	Observations.	No.
 ployed.	within this Station.	Ring Nets.	Eng- lish.	Scotch.	Manx.	French.		
	2†		33	30	3			
-	21	-	33	30	3	•	_	1
-	6		-	86	2	-	_	2
-	-	-	-	-		ū	See Col. 3, p, 174.	3
-	2	-	4	34	1	_	_	4
-	4	-	-	46	1		-	5
-	-	-	-	-		-	Caught in Mack- erel Nets.	6
	-	-	-	-	-	-	_	7
·	-	-	-	-		-	_	8
-	1	-	-	-	-		_	9
-	-	12	-		-	-	-	10
-	-			80	-	-	-	11
-	20 to 30	-	-	80	-		-	12
-	6	-	6	-	-	-	_	13
-	-	-	-	-	-	-	_	14
-	-	-	-	-	-	-	-	15
-	-	-	-	21	11	-	-	16
-	-	-	-	1	1	-	<u> </u>	17
-	<b>-</b>	<del>-</del> -	-	2.	2	-	Isle of Man, Scotch, and Irish boats from other Stations use this Pier.	18

<sup>†</sup> For one night only.

## SUMMER HERRING FISHING, 1905. (TABLE No. II.)

Herrings were also landed at the places set forth below, which are not included in the foregoing Return.

Coast Guard Station.	Places where Landed.	Quantity.	Value.
		Owts.	£ s. d.
Kingstown,	Kingstown,	30	21 13 0
Youghal,	Youghal,	57 <del>1</del>	15 5 6
Ballycottin,	Ballycottin,	1963	46 13 0
Union Hall, .	Union Hall,	171	5 15 0
Crookhaven,	Crookhaven, Spanish Cove, and Goleen.	211	17 10 0
Portmagee,	Portmagee,	88	31 17 6
Knightstown, .	Valentia,	63‡	38 2 0
Dingle,	Dingle,	2294	81 6 0
Ventry,	Ventry,	124	5 10 0
Smerwick,	Smerwick and Brandon Creek, .	631	11 16 0
Ross,	Ross,	111	5 1 3
South Aran,	South Aran,	235	65 17 6
Spiddle,	Spiddle to Barna,	100	20 0 0
Cleggan,	Cleggan,	2494	77 7 0
Killybegs,	Killybegs,	2141	3980
Dunfanaghy,	Dunfanaghy,	21	0 17 6
Rathmullen,	Rathmullen,	†220	220 0 0
Malin Head,	Portmore,	*35	2000
Cushendall,	Cushendall and Waterfoot,	57	12 0 0
Portmuck,	Portmuck, Hills port, and Browns- bay.	22	11 0 0
Omeath,	Greer's Quay,	10	2 10 0
Greenore,	Greenore,	198	66 4 0
Balbriggan,	Balbriggan,	55 <u>1</u>	26 15 0
Skerries,	Skerries,	511	25 14 0
Rush,	Rush,	19	13 5 0
	Total,	2,261	881 7 3

<sup>\* 8</sup> barrels cured for exportation.

<sup>† 136</sup> half barrels cured for exportation.

STATEMENT of the TOTAL QUANTITY and VALUE of the Fish returned as landed on the Irish Coasts during the Month and Seven Months ended 31st July. 1905, compared with the corresponding Periods of the Year 1904.

•				Ju	ıly.	Soven Mor 31st	nths ended July.
				1905.	1904,	1905.	1904.
The state of the s					QUAI	STITY.	
Brill,				Owts.	Cwtя. <b>88</b>	Cwts. 201	Owis. 317
Soles, Turbot,				332 70	262 74	2,391 435	1,779 376
Total Priz	ne Fish	ı <b></b>	•••	454	424	3,030	2,472
Cod, Conger Eel, Haddock,			•••	494 308 354	679 473 1,130 1,073	13.153 3.052 6.790	15,251 4,353 9,259 5,328 137,535
Hake Herrings,	•••	•••	•••	286 22,474	1,073 16,086 215	2,902 100,246	5,328 137,535
Ling, Mackerel,	•••	•••		370 14,254	21.629	6,059 224,451	4,671 286,736 11,251 5,897
Plaice, Ray or Skate,	•••	•••	•••	1,481 311	2,049 814	11,494 4,481	11,251 5,897
Sprats, Whiting,				131 1.563	115	180 9,275	
Fish not separa except shell lis	tely di		hed,	5,740	1,306 5,145	20,070	14,045 21,377
Total,	•••	•••	•••	48,250	51,138	405,183	518,308
Shell Fish:— Crabs,			•••	No. 47,386	No. 38,745 44'375	No. 99,277	No. 83,143 90,184
Lobsters, Oysters,		•••		85,356	44 375	155,543 188,804	90,184
Mussels, Other Shell F	 `is <b>h</b> ,			Cwts. 274 1,415	Owts. 63 939	Cwts, 4,276 11,568	Cwis. 4,913 9,577
					VA	LUE.	
D.401				£ 72	150	Ŧ.	i,
Brill, Soles,	•••	•••	•••	1,401	1,180 1,180 281	306 9,980	862 8,507 1,714
Turbot,	••	•••		213		1,839	1,714
Total Prin	ne Fish	,		1,519	1,635	12,125	11,083
Cod, Conger Eel,			:::	384 234	419 203	8,970 1,994	9,814 2,397 6,912 5,308 46,776 2,221 64 933
Haddock, Hake,		•••		369 355	914 947	4,856 4,590	6,912
Herrings,				6,522 279	7,066	38,833 4,916	46,776
Mackerel,	•••			3,848	3.961	50,648	64,923
Plaice, Ray or Skate,	•••		:::	1,393 165	1,830	11.706 2,646	1,779
Sprats, Whiting,				22 879	625	35 6,182	7 545
Fish not separa except shell iis	tely di h.	stinguis	he <b>d</b> ,	2,686	2,669	10,194	9,343
Total.	•••	•••		18,594	20,659	157,725	178,978
Shell Fish:— Crabs, Lobsters,	•••	•••		314 2,446	169 1,457	715 4,861	436
Oysters, Mussels		•••		28	1,701	359	3,212 315
Other Shell Fi	ish,	•••		375.	200	2,569	269 1,975
Total,	•••	•••		3,163	1,828	8,944	6,207
Total Value o	of Fish I	Landed,	•	21,757	22,487	166,669	185,185

NOTE.—The figures for 1905 are subject to correction in the Annual Returns.

STATEMENT of the TOTAL QUANTITY of FISH landed on the ENGLISH and Welsh Coasts during the Month and Seven Months ended 31st July, 1905, compared with the corresponding Periods of the Year 1904.

Soles						J	uly.	Sevon Me 31st	onths ended July.
Brill.						1905.	1904.	1905.	1904.
Brill.	A A STATE OF THE S					***	QUAN	TITY.	re parameter of after representation 41 of a sec
Soles,					- 1	Uwts.	Uwts.	Cwts.	Cwts.
Turbot		•.	•••	•••		2,276	2,333	16,219	16,651
Other Prime Fish,         433         634         1,219         1,321           Total Prime Fish,         16,021         14,863         106,526         97,766           Bream,          4,318         —         22,043         —           Catflish,          8,762         6,598         38,881         30,331           Coadlish,          101,112         —         63,512         —           Conger Eels,          4,379         3,527         32,610         26,436           Dabs,          9,756         8,584         61,409         65,961           Dory,          243         —         2,130         —           Gurnards,          8,323         7,622         58,614         58,300           Hake,          83,910         58,662         334,300         262,814           Hake,          83,910         58,662         334,300         262,814           Hailbut,          16,963         15,407         76,833         28,677           Ling,          17,160         14,627         120,023         109,077	Soles,	•••	•••	•••		6,363	6,113	45,544	39,055
Total Prime Fish,   16,021   14,863   106,526   97,766   Bream, 4,318   —   22,043   —   Catflish,		•••		•••		6,939	5,783	43,544	40,728
Bream,	Other Prim	o Fish,	• • • •	•••		443	634	1,219	1,321
Catilish,         8,762         6,598         38,884         30,331           Cadlish,         10,112         —         63,512         —           Cod,         101,345         84,173         887,656         823,714           Conger Eels,         4,379         3,527         32,610         26,436           Dabs,         9,756         8,584         61,409         65,961           Dory,         243         —         2,130         —           Gurnards,         8323         7,622         58,614         58,306           Haddock,         193,788         192,400         1,228,817         1,405,156           Hake,         83,910         58,562         334,300         262,816           Halibut,         10,963         15,407         76,873         68,098           Lemon Soles,         5,301         4,333         28,677         24,490           Ling,         17,160         14,627         120,233         33,083           Mogrims,         5,649         5,845         30,153         33,081           Mollet (Red),         105         —         818         —           Plaice,         72,895         66,261         541,70		Tota	ıl Prin	ne Fish,		16,021	14,863	106,526	97,755
Catilish,         8,762         6,598         38,884         30,331           Cadlish,         10,112         —         63,512         —           Cod,         101,345         84,173         887,656         823,714           Conger Eels,         4,379         3,527         32,610         26,436           Dabs,         9,756         8,584         61,409         65,961           Dory,         243         —         2,130         —           Gurnards,         8323         7,622         58,614         58,306           Haddock,         193,788         192,400         1,228,817         1,405,156           Hake,         83,910         58,562         334,300         262,816           Halibut,         10,963         15,407         76,873         68,098           Lemon Soles,         5,301         4,333         28,677         24,490           Ling,         17,160         14,627         120,233         33,083           Mogrims,         5,649         5,845         30,153         33,081           Mollet (Red),         105         —         818         —           Plaice,         72,895         66,261         541,70	Bream,		•••	•••	.	4,318		22.043	
Coaliish,   10,112					- 1		6.598		30.331
Cod,          101,345         84,173         887,666         823,714           Conger Eels,          4,379         3,527         32,610         26,436           Dabs,          9,756         8,584         61,469         65,961           Dogfish,          694          2,130            Dory,          243          2,130            Gurnards,          83,323         7,622         58,614         58,306           Haddock,          193,788         192,400         1,228,877         1,405,156           Hake,          83,910         58,562         334,300         2622,814           Hake,          16,963         15,407         76,873         68,092           Lemon Soles,          5,301         4,333         28,677         24,496           Ling,          17,160         14,627         120,023         109,073           Morgins,          5,649         5,845         30,153         33,081           Mollet (Red),          105          818	Coalfish,	•••	•••						-
Conger Ecls,         4379         3,527         32,610         26,436           Dals,         97,56         8,584         61,469         65,961           Dogfish,         694         —         9,873         —           Dory,         243         —         2,130         —           Gurnards,         8,323         7,622         58,614         58,306           Haddock,         193,788         192,400         1,228,877         1,405,156           Hake,         83,910         58,562         334,300         262,818           Halibut,         10,963         15,407         76,873         68,096           Lemon Soles,         5,301         4,333         28,677         24,496           Ling,         17,160         14,627         120,023         109,077           Mogrims,         5,649         5,845         30,153         33,081           Monks (or Angleis),         2,759         2,339         22,199         21,615           Mullet (Red),         105         —         818         —           Pollack,         1,016         —         7,604         —           Skates and Rays,         32,235         28,307         210,452 <td></td> <td></td> <td></td> <td></td> <td>- 1</td> <td></td> <td>84.173</td> <td></td> <td>823,714</td>					- 1		84.173		823,714
Dalse,	Conger Eel	i,		•••				1	
Dogfish,         694         —         9,873         —           Dory,         243         —         2,130         —           Gurnards,         83,23         7,622         58,614         58,306           Haddock,         193,788         192,400         1,228,877         1,405,156           Hake,         83,910         58,562         334,300         262,818           Halibut,         10,963         15,407         76,873         68,096           Lemon Soles,         5,301         4,333         28,677         24,490           Ling,         17,160         14,627         120,023         109,077           Megrims,         5,649         5,845         30,163         33,081           Mouls (or Angleis),         2,759         2,339         22,199         21,618           Mullet (Red),         105         818         —           Plaice,         73,895         66,261         544,170         473,955           Pollack,         1,016         7,603         —           Skates and Rays,         32,235         28,307         210,452         205,156           Whiting,         24,182         18,201         189,981         147,231	Dabs, .					1		. 1	
Dory,	Dogfish,	•••			- 1			1	
Gurnards,       8,323       7,622       58,614       58,306         Haddock,       193,788       192,400       1,228,877       1,405,156         Hake,       83,910       58,562       334,300       262,818         Halibut,       10,963       15,407       70,873       68,096         Lemon Soles,       5,301       4,333       28,677       24,496         Ling,       17,160       14,627       120,023       109,077         Megrims,       5,649       5,845       30,153       33,081         Monks (or Angleis),       2,759       2,339       22,199       21,613         Mullet (Red),       105       -       818         Plaice,       73,895       66,261       544,170       473,955         Pollack,       1,016       -       7,603       -         Torsk,       869       835       4,792       4,463         Whiting,       24,182       18,201       189,981       147,236         Witches,       4,610       3,279       27,280       20,855         Mackerel,       20,065       19,516       687,027       483,422         Herrings,	Dory,	•••	•••			243		1	-
Haddock,        193,788       192,400       1,228,877       1,405,156         Hake,        83,910       58,562       334,300       262,818         Halibut,        10,963       15,407       70,873       68,096         Lemon Soles,        15,160       14,627       120,023       109,077         Megrims,        5,649       5,845       30,153       33,081         Mouks (or Angleis),        2,759       2,339       22,199       21,615         Mullet (Red),        105       -       818       -         Plaice,        73,895       66,261       544,170       473,955         Pollack,        1,016       -       7,603       -         Torsk,        809       835       4,792       4,463         Whiting,        21,182       18,201       189,981       147,234         Witches,        4,610       3,279       27,280       20,515         Mackerel,        20,065       19,516       687,027       483,42         Herrings,	Gurnards,		•••	•••		8,323	7.622		58,306
Hake,	Haddock,	•••	•••	•••		193,788	, ,	1,228,877	
Halibut,	Hake,		•••			83,910	1	334,300	
Lemon Soles,	Halibut,	•••	•••	•••		1		i	
Ling,	Lemon Sole	8,	•••	•••		5,301		1	24,490
Megrims,        5,649       5,845       30,153       33,081         Mouks (or Angleis),        2,759       2,339       22,199       21,613         Mullet (Red),        105       —       818       —         Plaice,         73,895       66,261       544,170       473,953         Pollack,         1,016       —       7,603       —         Skates and Rays,         32,235       28,307       210,452       205,156         Torsk,         809       835       4,792       4,463         Whiting,        21,182       18,201       189,981       147,233         Witches,        4,610       3,279       27,280       20,851         Mackerel,        20,065       19,516       687,027       483,423         Herrings,         73,898       27,960       182,572       93,861         Pilohards,          26,179       32,998       175,959       270,76         Sprats,          26,17	Ling,	•••	•••	•••		17,160	, ,		•
Mouks (or Angleis),        2,759       2,339       22,199       21,613         Mullet (Red),        105       —       818       —         Plaice,         73,895       66,261       544,170       473,955         Pollack,         1,016       —       7,603       —         Skates and Rays,         32,235       28,307       210,452       205,156         Torsk,         809       835       4,792       4,463         Whiting,         21,182       18,201       189,991       147,234         Witches,         4,510       3,279       27,280       20,851         Mackerel,         20,065       19,516       687,027       483,42         Herrings,         73,898       27,960       182,572       93,86         Pilchards,          26,170       32,998       175,959       270,76         Sprats,          26,170       32,998       175,959       270,76	Megrims, .		•••	•••		5,649			33,081
Mullet (Red),        105       —       818       —         Plaice,         73,895       66,261       544,170       473,955         Pollack,         1,016       —       7,603       —         Skates and Rays,         32,235       28,307       210,452       205,156         Torsk,         809       835       4,792       4,463         Whiting,         24,182       18,201       189,981       147,234         Witches,         4,610       3,279       27,280       20,851         Mackerel,         20,065       19,516       687,027       483,423         Herrings,         73,898       27,960       182,572       93,861         Pilohards,           26,179       32,998       175,959       270,76         Sprats,           26,179       32,998       175,959       270,76         Total,         784,376       618,779       5,217,0	Monks (or A	Anglers	ı),	•••		2,759		22,199	•
Pollack,          1,016         7,603         -         7,603         -         -         5,85         -         -         -         7,603         -	Mullet (Red	1),	•••			105		818	
Pollack,          1,016         7,603         -           Skates and Rays,          32,235         28,307         210,462         205,156           Torsk,           809         835         4,792         4,463           Whiting,           24,182         18,201         189,981         147,231           Witches,           4,510         3,279         27,280         20,651           Mackerel,           20,065         19,516         687,027         483,428           Herrings,           73,898         27,960         182,572         93,866           Pilchards,           34,999         2,542         37,294         7,64           Sprats,            26,170         32,988         175,959         270,76           Total,           784,376         618,779         5,217,620         4,772,05           Shell Fish:—          No.         No.         No.         No.           Crabs,           474,563	Plaice, .		•••	•••		73,895	€6,261	544,170	473,952
Torsk,           809         835         4.792         4,46;           Whiting,           21,182         18,201         189,981         147,23;           Witches,           4,510         3,279         27,280         20,65;           Mackerel,           20,065         19,516         687,027         483,42;           Herrings,           73,898         27,960         182,572         93,86;           Pilchards,            -         25,253         37,294         7,64           Sprats,            26,179         32,998         175,959         270,76           Total,           784,376         618,779         5,217,620         4,772,05           Shell Fish:         No.         No.         No.         No.           Crabs,           474,563         519,403         4,389,612         4,368,77           Lobsters,           877,900         1,194,000         18,882,150         7,062,30           Cwts.<	Pollack,	•••	•••	•••		1,016	'	7,603	'
Whiting,        21,182       18,201       189,981       147,238         Witches,         4,510       3,279       27,280       20,85         Mackerel,         20,065       19,516       687,027       483,42         Herrings,          73,898       27,960       182,572       93,86         Pilchards,            25,253       37,294       7,64         Sprats,            26,170       32,998       175,959       270,76         Total,           784,376       618,779       5,217,020       4,772,05         Shell Fish:       No.       No.       No.       No.         Crabs,         474,563       519,403       4,399,612       4,368,77         Lobstors,          877,900       1,194,000       18,882,150       17,062,30         Cwts. </td <td>Skates and</td> <td>Rауя,</td> <td>•••</td> <td>•••</td> <td></td> <td>32,235</td> <td>28,307</td> <td>210,452</td> <td>205,150</td>	Skates and	Rауя,	•••	•••		32,235	28,307	210,452	205,150
Whiting,        24,182       18,201       189,981       147,236         Witches,        4,510       3,279       27,280       20,65         Mackerel,        20,065       19,516       687,027       483,42         Herrings,         73,898       27,960       182,572       93,86         Pilchards,          25,252       37,294       7,64         Sprats,          26,179       32,988       175,959       270,76         Total,        784,376       618,779       5,217,620       4,772,05         Shell Fish:       No.       No.       No.       No.         Crabs,        474,563       519,403       4,389,612       4,368,77         Lobsters,         877,900       1,194,000       18,882,150       7,062,30         Cwts.       Cwts.       Cwts.       Cwts.       Cwts.       Cwts.		•••	•••	••		809		4,792	4,463
Witches,         4,510       3,279       27,280       20,856         Mackerel,         20,065       19,516       687,027       483,428         Herrings,          73,898       27,960       182,572       93,86         Pilchards,           25,242       37,294       7,64         Sprats,          26,179       32,998       175,959       270,76         Total,         784,376       618,779       5,217,620       4,772,05         Shell Fish:       No.       No.       No.       No.         Crabs,         474,563       519,403       4,389,612       4,368,77         Lobsters,         877,900       1,194,000       18,882,150       7,062,30         Cwts.       Cwts.       Cwts.       Cwts.       Cwts.		•••	•••	•••		21,182	18,201	189,981	147,239
Mackerel,         20,065       19,516       687,027       483,42.         Herrings,         73,898       27,960       182,572       93,86         Pilchards,          34,999       2,542       37,294       7,64         Sprats,           26,170       32,998       175,959       270,76         Total,         784,376       618,779       5,217,020       4,772,05         Shell Fish:—       No.       No.       No.       No.         Crabs,         474,563       519,403       4,389,612       4,368,77         Lobstors,         877,900       1,194,000       18,882,150       17,062,30         Cwts.       Cwts.       Cwts.       Cwts.       Cwts.			•••	•••	•••	4,510		27,280	20,855
Herrings,			•••	•••		20,065	' !	687,027	483,423
Pilchards,         34,999       2,542       37,294       7,64         Sprats,         -       25,253       37,86         Fish, all other, except Shell Fish,       26,179       32,988       175,959       270,76         Total,        784,376       618,779       5,217,620       4,772,05         Shell Fish:—       No.       No.       No.       No.         Crabs,        474,563       519,403       4,399,612       4,368,77         Lobsters,         151,137       125,102       457,616       407,18         Oysters,         877,900       1,194,000       18,882,150       17,062,30         Cwts.       Cwts.       Cwts.       Cwts.       Cwts.			•••	•••		73,898		182,572	93,868
Sprats.           25,253       37,86         Fish, all other, except Shell Fish,       26,179       32,998       175,959       270,76         Total,        784,376       618,779       5,217,620       4,772,05         Shell Fish:—       No.       No.       No.       No.         Crabs,         474,563       519,403       4,339,612       4,368,77         Lobsters,         151,137       125,102       457,616       407,18         Oysters,         877,900       1,194,000       18,882,150       17,062,30         Cwts.       Cwts.       Cwts.       Cwts.       Cwts.	Pilchards,	•••	•••	•••		34,999	2,542	37,294	7,643
Fish, all other, except Shell Fish,       26,170       32,998       175,959       270,76         Total,        784,376       618,779       5,217,620       4,772,05         Shell Fish:—       No.       No.       No.       No.         Crabs,         474,563       519,403       4,389,612       4,368,77         Lobsters,         151,137       125,102       457,616       407,18         Cysters,        877,900       1,194,000       18,882,150       17,062,30         Cwts.       Cwts.       Cwts.       Cwts.       Cwts.	• •	•••				****		25,253	37,865
Shell Fish:—         No.         No.         No.         No.           Crabs,           474,563         519,403         4,399,612         4,368,77           Lobstors,           151,137         125,102         457,616         407,18           Oysters,          877,900         1,194,000         18,882,150         17,062,30           Cwts.         Cwts.         Cwts.         Cwts.         Cwts.	Fish, all otl	ie <b>r</b> , ex	cept S	hell Fish	۱,	26,179	32,998	175,959	270,766
Crabs,         474,563       519,403       4,389,612       4,368,77         Lobsters,         151,137       125,102       457,616       407,18         Oysters,         877,900       1,194,000       18,882,150       17,062,30         Cwts.       Cwts.       Cwts.       Cwts.       Cwts.		Tot	al,	•••		784,376	618,779	5,217,620	4,772,057
Crabs,         474,563       519,403       4,389,612       4,368,77         Lobsters,         151,137       125,102       457,616       407,18         Cysters,         877,900       1,194,000       18,882,150       17,062,30         Cwts.       Cwts.       Cwts.       Cwts.       Cwts.	Shell Fish:					No.	No.	No.	No
Lobsters, 151,137 125,102 457,616 407,18  Oysters, 877,900 1,194,000 18,882,150 Owts. Owts. Cwts. Cwts.	Crabs,	•••	•••	•••				!	
Oysters 877,900 1,194,000 18,882,150 17,062,30 Owts. Owts. Owts. Cwts.			•••	•••					
Owts. Owts. Owts. Cwts.			••		- 1				
Other Chall Dish								1	
20,000   20,000   20,000   208,040   199.54	Other Sh	ell Fisl	n,	•••		26,653	28,882	208,040	199,548

NOTE.—The figures for 1905 are subject to correction in the Annual Returns.
Bream, Coalfish, Dogfish, Dory, Red Mullet, and Pollack, were not separately distinguished in 1904.

STATEMENT of the TOTAL VALUE of FISH landed on the ENGLISH and Welsh Coasts during the Month and Seven Months ended 31st July, 1905, compared with the corresponding Periods of the Year 1904.

					Ju	ıly.	Seven Mor 31st	ths ended July.
					1905.	1904.	1905.	1904.
						VAI	UK.	
Brill,					£ 5,427	£ 5,561	£ 42,726	41,725
Soles.	•••				39,960	38,522	273,259	247,714
Turbot.	•••	•••			20,358	16,717	155,651	144,650
Other Prin	ne Fiel	h,	•••		624	899	1,852	1 947
			me Fish	,	66,369	61,699	473,488	436,036
Bream.					1.111	_	7,452	
Catfish.			•••		1,475	1,099	11,824	9,173
Coaldsh.					2,5.8	-,000	20,558	
Cod.					49,396	38,217	522,621	466,007
Conger E					2,933	2,236	23,233	20,158
Dabs.					6,023	5,356	45,623	48,128
Dogfish,					268		2,964	
Dory,					127		1,684	
Gurnards,				)	2.059	1,834	18,570	18,434
Haddock.					80,526	67,099	799,487	811,282
Hake.					33,956	24,216	196,665	145,710
Halibut.					25,178	22,326	143,413	132,983
Lemon So			•••		9,788	7,515	61,911	53,298
Ling.					7,940	6,737	70,716	57,372
Megrims,	•••		•••		2,510	2,814	18,867	20,127
Monks (or			•••		768	674	8,392	•
Muilet (R	_	"71	•••		215	017	1,736	7,092
Plaice.	•••	••			68,028	63,438	510,728	AA9 061
Pollack.	•••	•••	•••		429	05,456	4,433	442,961
Skates and		•••			14.062	11,880	117,049	109 017
Torsk,		•••	•••	1	282	327	1,995	108,917
Whiting.				•••	8,312		91,284	1,866
Witches,	•••	•••	•••		3,137	6,298	26,872	67,023
Mackerel,	•••	•••	•••	•••		2,022	1	18,429
Herrings.		•••	•••	***	8,473 22,775	8,681	299,544	248,589
Pilchards,	•••	•••	••		8,106	8,447	59,740	43,323
Sprats,		•••	•••	•••	9,100	847	8,800	2,549
Fish, all o	 there	 reent	 Shall Nic	٠٠٠ ا	22,573	23,110	3,867 109,536	4,127
* iou, all o	Tot							151,432
	.1.01	1:2L1,	***		449,377	366,872	3,663,052	3,315,016
Shell Fish	:				Ì			
Crabs,	•••	•••			8,096	7,871	46,442	43,549
Lobsters	-	•••	•••		6,577	5,463	20,374	18,846
Oysters,		•••	•••		1,812	2,350	53,208	46,859
Other S	bell Fis	h,	***		10.643	11,773	61,125	63,980
7	lotal,	•••	•••		27,128	27,457	181,149	173,234
,	Potal vo	lna of	all Fish	1	476,505	394,329	3,844,201	
L	Compt Aff	rng OI	cer L 181	,	#10,000	00±,020	0,022,601	3,488,250

NOTE.—The figures for 1905 are subject to correction in the Annual Returns.
Bream, Coalfish, Dogfish, Dory, Red Mullet, and Pollack were not separately distinguished in 1904.

STATEMENT of the TOTAL QUANTITY and VALUE of the FISH returned as landed on the Scottish Coasts during the Month and Seven Months ended 31st July, 1905, compared with the corresponding periods of the Year 1904.

			J	uly.		onths ended July.
			1905.	1904.	1905.	1904.
				QUA	NTITY.	
		l	Cwts.	Cwts.	Cwts. 92	Cwts.
Sparling,		•••	9 784	4	92	75
Turbot, Cod,			57.099	46.709	3,723 468,211 15,043	432,047
Conger Rel	• 5	!		1,102	15,043	12,658
Flounders, Plaice, Brill, Haddock			5,745 66,857	72.053	48,690 512,524	520.749
Haddock, Halibut,	•••	i		6,212	24,505	27,087
Halibut, Herrings, Lemon Soles, Ling, Mackerel, Saith (Coal Fish), Skate and Rays, Sprats, Torsk (Tusk), Whiting	•••	:::		791 46,709 1,102 5,729 72,053 6,212 1,747,101 3,223 18,773 4,445 10,318 7,484	2,634,227 15,554 104,962 7,036 83,977	75 4,010 432,047 12,653 49,411 520,749 20,749 21,967,366 14,217 94,436 5,254 58,840 89,540 20,849 8,465
Ling,	•••		17,360	18,773	104.962	90,436
Mackerel, Saith (Coal Fish),	•••		5.575 <b>14.94</b> 0	10 318	7,036 83,977	5,254 58 840
Skate and Rays,	•••	!	7,802	7,484	71,943	69,540
Sprats, Torsk (Tusk),	•••		1.711	2 255	1.347 12,473	20.849 8,465
		:::	14,968	2,255 9,045	119,733	79.572
Fish not separately di- except Shell Fish.	stinguishe	d.	8,171	7 400	55,047	57,589
Total,			1,557,153	1 949 944	4.174.087	4 419 110
LOUII,	•••	•••	1,001,100	1,942,644	7,117,001	4,418,110
Shell Fish:-		ï	No.	No.	No.	No.
Crabs, Lobsters,		••• }	184,470 112,858	102,395	1,278,198 666,571	1,602,337 379,749 141,189
Oysters,			112,000	63,324	107,055	141.139
•		ĺ	Cwts.	Cwts.	Cwts.	Cwts.
Clams, Mussels,	•••		174	80	4,651	3,993 43,868
Other Shell Fish,		:::	4,390 2,922	3,599 8,147	46,216 35,405	43,868 36,813
		ļ.				
,					.UE.	
Charling		ļ	£ 38	£ 29	£ 297	£ 291
Sparling, Turbot,	•••		1,971	1,747	11.791	12,492
Cod	••		19,996 171	14,912	188.624	12,492 166,745
Conger Eel, Flounders, Plaice, Brill,			7,692	7,212	6.365 54.136 292,081 38,982	61,244
Haddock,	••		7,692 27,779 6,402	23,553	292,081 38,982	283,742
Halibut,	•••	::	360.478	326.222	674,986	622,C56
Haddock, Halibut, Herrings, Lemon Soles, Ling, Mackerel, Saith (Coal Fish) Skate and Rays,	•••		5,351	29 1,747 14,912 7,212 23,553 7,643 326,222 4,498 5,020	28,462	166,745 6,050 61,244 283,742 40,636 622,637 27,837 30,404 1,984 10,364
Ling,	••		4,439 1,646		34,767 2,184	1,984
Saith (Coal Fish)	•••		2,268	1,556 1,350	14,007	10,364
Skate and Rays,	••	••• [	1,111	1,022	18,553 222	18,468
Torsk (Tusk),	•••		413	508	2,664	1,911
Whiting. Fish not separately di			3,912 3,237	2,116 2,610	43,717 81,020	1,004 1,911 28,945 38,794
except Shell Fish.	ectif grand	٠, ١	'','	2,010	V.,VeV	00,102
Total,	•••	•••	446,804	400,433	1,442,858	1,347,937
Shell Fish:		ľ				
Crabs,	•••		1,290	1,354 2,813	8,415	10,558
Lobsters,	•••		2,583	2,813	19,902 429	20,177
Oysters,			26	18	Aun i	20,177 528 557
Mussols Other Shell Fish.			242 834	252 909	2,889 8,869	10,1 <b>83</b>
Total,		•••	4,975	5,341	41,251	44,698
Total Value of F	ish landed	1,	451,779	405,774	1,484,112	1,392,635
					,	

NOTE.—The above figures are subject to correction in the Annual Returns.

RETURN OF AVERAGE PRICES for each Province and for the Whole of Ireland of Crops, Cattle, Sheep, and other Agricultural Produce for the Quarter ended 30th June, 1905, and for the Whole of Ireland for the corresponding Quarter of 1904.

,		Prov			Whole	Whole
Product.		Munster.		Con- naught.	Ireland, 1905.	
Ckops :	s. d.	e. d.	я. d.	я d.	r. d.	s. d.
Wheat, per 1121bs.				-	-	-
White Oats,,	6 113	7 45	6 61	6 33	6 7	6 5}
Black Onts, , .,	6 41	6 2			6 34	6 14
Barley,,	66	·		-	6 6	-
Potatoes, , ,	2 8	3 10	2 61	3 84	2 103	4 04
Нау,	3 119	2 54	3 6	18	3 2	3 94
Perennial Rye Grass Seed, per 112 lbs.						_
Italian Rye Grass Seed,			_		_	_
Flax, . per 14 lbs.	per 14 lbs. —			_	-	-
STORE CATTLE :-	£ & d.	£ s, d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
One year old, per head,	7 7 7	7 3 1	6 1 11	6 13 10	6 15 6	6 15 8
Two years old,	10 13 2	9 6 4	8 11 3	9 12 8	9 10 8	9 4 1
Three years old, "	13 12 7	13 9 10	*8 5 0	12 7 0	12 15 5	12 13 6
Springers	14 2 10	13 9 2	12 15 9	13 13 4	13 7 2	13 0 6
STORE SHREP:-						
Lambs, per head,	1 7 3	1 6 2	1 6 7	0 17 8	1 5 7	1 5 5
Over 12 & under 24 months old, "	2 2 0	:   209	137	205	2 0 4	1 18 5
Two years old and upwards, ,,		1 0 10	165	2 0 1	1 18 3	1 12 10
tend apwaran, "		1 0 10	1 ", "	- 0 1	140 0	1 12 10
MISCELLANROUS PRODUCE:	к. d.	s. d.	s. d.	s. d.	s. d.	s. d.
BUTTER per 112 lbs.	91 34	91 24	86 22	86 3	91 17	83 72
Eaas, , , per 120,	6 101	6 6)	-	5 74	6 21	5 103
PORK, . per 112 lbs.	47 93	51 3	<b>51 0</b>	50 24	51 2	42 104
BEEF, "	_	<u> </u>	_	_	67 31	60 0
MUTTON, ,,	_	<u> </u>	_	-	69 7 <u>1</u>	70 113
WOOL, per lb.	1 07	0 113	-		1 0%	0 98
	l	1.		i		1

ard Class.

STATEMENT showing the AVERAGE PRICES of WHEAT, OATS, and BARLEY per 112 lbs., computed from Market Returns of certain quantities of these Cereals supplied to the Department of Agriculture and Technical Instruction for Ireland by Inland Revenue Officers, for each Week of the QUARTER ended 30th JUNE, 1905.

Reti	1 - 221 0	W	EAT.	o	ATS.	BA	RLEY.
receiv the Week	red in	Average Price per 112 lbs. Quantity		Average Price per 112 lbs.	Quantity.	Average Price per 112 lbs.	Quantity
20111 MACH (WINE)		 s. d.	Cwts. of 112 lbs.	s. d.	Cwts. of 112 lbs.	s. d.	Cwts, of 112 lbs.
April	1,	-		6 24	2,7413	6 6	600
"	8,	!		6 84	4,7961	- !	
••	15,	- :		6 54	2,5764	1 1	****
,,	22,	-		6 5	2,453		-
••	29,	- :		6 33	2,6054		
May	6,	_		6 44	2,1863	-	
,,	13,	_ :		6 41	2,208	-	
,,	20,			6 42	2,7434	-	*
**	27,	-		6 7	1,1614	-	
June	3,	-		6.8	1,277 }	-	
**	10,	-		6 103	581	-	
,,	17,	-	•	6 94	9961		_
**	24,	- 1		6 84	8311	-	

TABLE showing the Average Price per 112 lbs., Live Wright, of FAT CATTLE and FAT SHERP sold in the Dublin MARKET during the Quarter ended 30th June, 1905, and also for the corresponding period during the eight preceding years.

DESCRIPTION.					YEAR.				
DESCRIPTION.	1905	1904.	1903.	1902.	1901.	1900.	1899.	1898.	1897.
Fat Cattle Fat Sheep	8. 6 32 8 39 9	. s. d. 34 34 40 61	s. d. 34 51 40 35	37 4	33 4	34 114	s. d. 33 71 36 31	s. d. 30 62 34 9	s. d. 33 31 37 104

STATEMENT Showing the NUMBERS of CATTLE and SHEEP in respect of which "Laye Wright" Returns have been furnished to the Department of Agriculture and Technical Instruction for Ireland, as under, during the Quarter ended 30th June, 1905.

			Numbers inch Fr	Numbers included in Returns of Live Weight of Fat Cattle furnished by	f Live Weight of d by	Numbers included in Returns of Live Weight	Total Number of	Numbers inclu Live Weigh furni	Numbers included in Returns of Live Weight of Pat Sheep furnished by	Total Number of
WEEK RIDED Dublin Mr. Gavin Low Corporation Mr. Gavin Low Market (Dublin). Authorities.			Mr. Gavin Le (Dublin).		Mr. John Robson (Belfast).	of Store Cattle furnished by Official Reporters of Prices.	Cattle included in Returns.	Dublin Corporation Market Authorities.	Mr. Gavin Low (Dublin).	Sheep included in Returns.
	magan militar ang	magan militar ang	28	***************************************	8	ı	178	56	155	211
55			8		55	64	246	35	281	313
15			119	***********	æ	ı	233	æ	35.0	<b>41</b> 3
22, 61 63			8		33	ı	160	45	315	360
29.			35		53	waf .	500	45	318	æ
63	rather to the	rather to the	=		37	1	211	27	241	268
13,			=======================================		33	73	996	33	361	391
20, 81			88		31	1	101	9	439	667
27, 65 88			86		83	1	181	0#	336	376
3 76			69		37	ı	182	92	251	103
10 81			\$		53	1	181	8	219	249
17 84 67	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	19		43	ı	161	20	346	366
24, 89 45			<b>5</b>		42	88	204	30	263	283
Totals, 923 1, 99			1,09		497	151	2.673	531	3,375	4,406

## TABLES SHOWING THE EXPORTS

TABLE
RETURN of the Number of Animals Exported from Ireland to Great
Ports of Embarkation

			CATTLE	<b>.</b> .			SHEEP			SWINK	<b>.</b>
IRISH PORTS.	Fat.		Other Cattle.	Calves	1	i	Lambs	Total.	Fat.	Stores.	Total.
Ballina,	9	38	21	•	71	52	274	326	271		271
Belfast,	3,572	28,562		350	32,484	624	2,222	2,846	1,032		1,092
Coleraine,	3	463	3		469				34		34
Cork,	93	5,193	7	6,737	12,030	4,110	10,102	14,212	2,361		2,361
Drogheda, .	1,676	424			2,100	5,128	19,427	24,555	1,508	15	1,523
Dublin,	12,762	31,472	124	4,234	48,592	26,483	65,072	91,555	24,896		24,896
Dundalk,	1,431	2,392			3,823	629	5,404	5,933	2,063		2,063
Dundrum (Co. Down).	•	23			23						
Greenore, .	122	4,511			4,633	3,834	1,186	5,320	129		129
Larne,	350	8,256			8,606	132	43	175	49	•	49
Limerick,	95	205		201	501		2	2			
Londonderry, .	4,202	13,767	25	5,294	23,258	4,227	3,916	8,143	480	•	480
Newry,	310	498			808	344	1,305	1,649	228		228
Portrush,	1	225			226				154		164
Sligo,	4	340	•	•	314	389	707	1,096	5,457		5,457
Waterford, .	3,986	10,125	37	33	14,181	4,361	9,002	13,366	6,613		6,613
Westport, .	17	51	41		109	1,329	1,414	2,743	725	•	725
Wexford,	761	742		•	1,503	1,947	1,514	3,461	1,432		1,432
Total,	29,394	107,287	261	16,849	163,791	53,522	121,890	175,412	47,492	15	47,507

### AND IMPORTS OF ANIMALS.

I.

BRITAIN during the Three Months ended 30th June, 1905, showing the in Ireland.

			Hoi	ises.		Mules		Total	
	Gonts.	Stallions.	Mares.	Geldings.	Total.	or Jenneis,	Asses.	Animals.	IRISH PORTS.
			•					668	Ballina.
	101	2	960	2,036	2,998		28	39,549	Belfast.
	•							503	Coleraine.
	•	1	115	193	309	, •	354	29,296	Cork.
١	17		28	25	53		1	28,249	Drogheda
	68	40	1,393	1,104	2,537	1	40	167,679	Dublin.
	1,107		264	296	560		226	18,712	Dundalk.
	3		•				1	26	Dundrum (Co. Down),
١	268		1,113	723	1,836		1	12,187	Greenore.
	18	1	50	62	113		5	8,966	Larne.
Ì	•		•	4	4			507	Limerick.
	2	1	89	113	203		1	32,117	Londonderry.
	1	1	8	6	14		•	2,700	Newry.
	•	·	1	2	3			<b>38</b> 3	Portrush.
	•		2	2	4		2	6,903	Sligo.
	2	1	459	459	919	1	427	35,509	Waterford
	•		8	1	7		3	3,587	Westport.
	. 2		3	6	8		٠.	6,406	Wexford.
	1,578	47	4,490	5,081	9,568	8	1,089	388,947	Total.

TABLE
RETURN of the Number of Animals Exported from Ireland to Great
Ports of Debarkation

	!		CATTLE	•			Sheep.			SWINE.		l
BRITISH PORTS.	Fat.	Stores.	Other Cattle.	Calves.	Total.	She <b>e</b> p.	Lambs.	Total.	Fat.	Stores.	Total.	
Ardrossan, .	88	5,042		•	5,180	6	33	39	182		182	
Ayr,	290	11,409	•	245	11,944	234	423	657	177		177	l
Barrow,	883	4,252	•		<b>5,13</b> 5	40	30	70	823		823	
Bristol, , .	993	4,839		3,089	8,921	4,051	813	4,884	<b>2,89</b> 3	•	2,893	
Dover,	•	11			11	98		96				
?leetwood	3,032	3,093	•	59	6,234	1,518	1,925	3,443	48		48	
lasgow,	1,394	17,565	149	9,647	28,755	469	4,023	4,492	8 <b>,33</b> 2		8,332	l
reenock,	1 <b>6</b> 8	2,748	. !	31	2,947				13		13	l
Heysham,	303	10,751	19	22	11,095	1,115	710	1,825	2,894		2,894	
lolyhead, .	3,338	16,520	22	17	19,897	12,771	19,396	32,167	10,878		10,878	
iverpool,	12,260	15,754	70	1,016	29,100	27,895	84,713	112,608	16,463	15	16,478	
ondon,	•	•	•	•						•	•	
fanchester, .	2,913	607	•		3,550	2,718	4,323	7.041	970	•	970	
filford,	2,459	6,308	1	2,503	11,271	2,609	5,468	<b>8,0</b> 77	<b>3,8</b> 03		3,808	
Newhaven	•	45	•	•	45		•				•	l
lymouth, .	24	63	•	129	206	٠				•	•	
Billoth,	827	929		•	1,758		<b>3</b> 3	<b>3</b> 3			•	l
Southampton, .	•	85		91	176	•		,	16	•	16	l
itranraer,	836	6,426		•	6,7 <b>6</b> 2			,			•	I
Whitehaven, .	6	860		•	856	•	•		•	•	•	
Total,	29,394	107,287	261	16,849	168,791	53,592	121,890	175,412	47,492	15	47,507	

II.

Britain during the Three Months ended 30th June, 1905, showing the in Great Britain.

		Ног	rses.		Mules		Total	
Goats.	Stallions.	Mares.	Goldings.	Total.	or Jennets.	A8808,	Animals.	British Ports,
 an another chartes become a			'   					and the second s
64	1	116	295	412	٠	1	5,828	Ardrossan.
36	1	44	88	133	·	3	12,950	Ayr.
1		96	236	332		1	6,362	Barrow.
	1	101	131	233		345	17,256	Bristol.
•	•	•					107	Dover.
•	2	314	693	911		3	10,639	Fleetwood.
1	2	181	368	551		10	42,141	Glasgow.
•	•	6	11	17			2,977	Greenock.
1	•	192	337	529		15	16,359	Heysham,
270	37	2,171	1,492	3,700		33	66,945	Holyhead.
1,177	1	636	792	1,429	1	311	161,104	Liverpool.
•		•	2	2			2	London.
6		72	46	118	1	6	11,692	Manchester.
2	1	469	487	957		356	24,466	Milford.
•		1	3	4			49	Newhaven.
•		1	10	11			217	Plymouth.
		4	1	5			1,794	Silloth.
•		. 10	14	24			216	Southampton.
18	1	49	68	. 11 <b>2</b>		4	6,896	Stranmer.
2		27	61	88		1	917	Whitehaven.
1,578	47	4,190	6,031	9,568	2	1,089	388,947	Total.

RETURN OF the Number of Animals Imported into Ireland from Great of Debarkation

			CATTLE				Sheep.			SWINE		
IRISH PORTS.	Fat.	Stores.	Other Cattle.	Calves.	Total.	Sheep.	Lambs.	Total.	Fat.	Stores.	Total.	
Ballina, .			•					•	•			
Belfast,		44		4	48	1,331	•	1,331				
Coleraine, .	•	•		3	3							
Cork,	•	2	•	2	4							
Drogheda, .	•						•		•			
Dublin,	•	96		4	100	134		134	8	•	8	
Dundalk, .	•	1	•	•	ı				•			
Dundrum, .	•			•	•							
Greenore, .	•			•	•				•			
Larne,	•	37		•	37		1	1	,			
Limerick, .		•		•	•		•					
Londonderry		3		•	3	176		176		•		
Newry,	•	•		•	•		•					
Portrush,		•						•				
Sligo,	•	•			•	50		50				
Waterford, .		1			1	183	13	196	,		•	
Westport, .	•		•			5		5		•	•	
Wexford, .					٠	<u>.</u>					•	
Total,	•	184	•	18	197	1,878	14	1,803	8	•	•	

III.

Britain during the Three Months ended 30th June, 1905, showing the Ports in Ireland.

		Hoi	rsks.		Mules		Total	
Goats.	Stallions.	Mares.	Geldings.	Total.	or Jennets.	Asses.	Anima)s.	Irish Ports.
		•	•	•				Ballina
.	4	92	238	329	·		1,708	Belfast.
.		•	1	1			4	Coleraine.
•	2	36	35	73			77	Cork.
	;	1	5	6			6	Drogheda.
1	27	507	845	879		1	1,123	Dublin.
		10	23	32			53	Dundalk.
•								Dundrum.
•		13	19	32		1	33	Greenore.
	1	6	16	23			61	Larne.
.		•	•		·			Limerick.
	1	16	10	27			205	Londonderry.
1 .	1	3	4	8			8	Newry.
		1	•	1		•	1	Portrush.
		•	1	1			51	Bligo.
.	1	63	88	147		5	349	Waterford.
.				•			5	Westport.
<u>.</u>	٠,-	3	2	5			5	Wexford.
1	87	761	778	1,584	•	7	3,669	Total.

TABLE

RETURN of the Number of Animals Imported into Ireland from Great Britain

Embarkation in

			CATTLE	•			Sh <b>re</b> p.			SWINE	•
British Ports.	Fat.	Stores.	Other Catile.	Calves.	Total.	Sheep.	Lambs.	Total.	Fat.	Storen.	Total
Ardrossan, .	•	13			13	1,063		1,063		,	
Ayr,		6			6	179		179			
Barrow,							•				
Bristol,	•	1		•	1	٠					
Falmouth,	•			•				,			•
Fleetwood, .		2			2						
Glasgow,	•	15		7	22	528	13	541		.	•
Greenock, .	•			•		107		107		.	
Heysham, .		18		•	18				٠		
Holyhead, .		38		3	41	1		1	8		8
Liverpool, .		15		1	16				•		
London,									•		
Manchester, .						,					
Milford,	•	2		2	4				•		
Newport, .								.			
Plymouth, .	•						.				
Silloth,		35			35						
Southampton, .		2			2				•		
Stranraer, .		37			37		1	1	•		
Whitehaven, .		•						•			
Total,		184		13	197	1,878	14	1,892	8	•	8

IV during the Three Months ended 30th June, 1905, showing the Ports of Great Britain.

		Charles and the control of the contr	1101	18E <b>8.</b>		Mules		Total	
G	oats.	Stallions.	Mures.	Geldi <b>ngs.</b>	Total.	or Jennets.	Asses.	Animals.	BRITISH PORTS.
	•	•	9	23	32			1,108	Ardrossau.
	•	1	3	9	13			198	Ayr.
	•		1	1	2			2	Barrow.
	•		23	21	44		•	45	Bristol.
	•		1		1			1	Falmouth.
	•	1	40	102	143	s •	•	145	Fleotwood.
	•	5	56	74	135			608	Glasgow.
			1	2	3			110	Greenock.
	•	1	9	12	22	·		. 40	Heysham.
İ	•	23	424	303	780		1	801	Holyhead.
	1	2	44	99	145		1	163	Liverpool.
	•		1	5	6	٠		6	London.
	•	•	13	5	18		·	18	Manchester.
		1	74	88	163	·	5	172	Milford.
	•			•	•	٠	•		Newport.
		1	12	10	23		•	23	Plymouth.
	•	1	34	6	41		•	76	Silloth.
	•	•	•	•	•		•	2	Southampton.
	•	1	6	16	23	٠	•	61	Stranraer.
					-		•		Whitehavon.
	1	87	751	776	1,564	•	7	3,669	Total

# RETURN of the Number of Animals Exported from Ireland to the showing the Ports of

			CATTLE	G.					
IRISH PORTS.	Fat.	Stores.	Other Cattle.	Calves	Total.	Sheep.	Lambs.	Total.	
BELFAST,		190	,	2	192	31		31	
DUBLIN,		111		•	111		•		ĺ
TOTAL,	•	301	•	2	303	31		31	

# RETURN of NUMBER of ANIMALS EXPORTED from IRELAND to the showing the Ports of Debarkation

			Cattle	t.					
ISLE OF MAN PORT.	Fat.	St <b>or</b> es.	Other Cu <b>ttle,</b>	Calv <b>es</b>	Total.	Sheep.	Lambs	Total.	
DOUGLAS,		301	•	2	303	31	•	81	

# RETURN of the Number of Animals Imported into Ireland from the showing the Ports of

			CATTLE	i.					
IRISH PORTS.	Fat.	Stores.	Other Cattle.	Calves	Total.	Sheep.	Lambs.	Total.	
BELFAST,									
Dublin,		<u>.</u>					•		
TOTAL,	•	•	•	•	•	•	•	•	

# RETURN of the Number of Animals Imported into Ireland from the showing the Ports of Embarkation

		•	CATTLE	i.					
ISLE OF MAN PORT.	Fat.	Stores.	Other Cattle.	Calves	Total.	Sh <b>e</b> ep.	Lambs.	Total	
DOUGLAS,	• :				•		•	•	

ISLE OF MAN during the Three Months ended 30th June, 1905, EMBARKATION in IRELAND.

	SWINE.				Пов	ses.					
Fat.	Stores.	Total.	Goate.	Stal- lions.	Ma <b>re</b> s.	Gold- ings.	Total.	Mules or Jennets	Авнев.	Total Ani- mals.	Irish Port <b>s</b> .
			1		10	25	35			259	Belfast.
										111	DUBLIN.
		•	1		10	25	<b>3</b> 5	·	·	370	TOTAL.

ISLE OF MAN during the Three Months ended 30th June, 1905, in the Isle of Man.

	8wine				Hor	SES.					
 Fat.	S <b>tor</b> es.	Total.	Gosta.	Stal- lions.	Mares.	Geld- ings.	Total.	Mules or Jennets	Asses.	Total Ani- mais.	ISLE OF MAN PORT.
•	•	•	1		10	25	35	•	•	370	DOUGLAS.

ISLE OF MAN during the Three Months ended 30th June, 1905, DEBARKATION in IRELAND.

	SWINE.				Hor	s <b>es</b> .					
Fat.	Stores.	Total.	Gonts.	Stal- lions,	Mares.	Geld- ings.	Total.	Mules or Jenneta	Аязев	Total Ani- mals.	Irish Ports.
					•	•				,	BELFAST.
Ŀ	·	·					•				DUBLIN.
•	•		·	•	•	•	•	•	•	•	TOTAL.

ISLE OF MAN during the Three Months ended 30th June, 1905, in the ISLE OF MAN.

	SWINE	•			Нов	ises.					
Fat.	Stores.	Total.	Goats.	Stal- lions.	<b>M</b> ar <b>e</b> s.	Geld- ings.	Total.	Mules er Jennets	Asses	Total Ani- mais.	ISLE OF MAN PORT
	•	•	•	•	•	•				•	DOUGLAS.

### COASTING AND

# RETURN of the Number of Animals Shipped to and from Places in Ireland of Embarkation

			CATIL	E.			SHEBP.		SWINE.			
IRISH PORTS.	Fat.	Stores.	Other Cattle.	Calves.	Total.	Sheep.	Lambs.	Total.	Fat.	Stores.	Total.	
Cork to Aghada Pier,	•	1		5	6		20	20				
" to Belfast,												
" to Spike Island, .	١.	١.							١.	7	7	
, to Queenstown, .				١.		2		2				
, to Waterford,	١.		١.	١.								
Total,		1		5	- 6	2	20	22		7	7	
Aghada Pier to Cork,	<u> </u>	1		<del> </del>	1	90	140	230	117		117	
Spike Island ,									5		5	
Queenstown "	١.					4		4	18	•	18	
Waterford " .		9		6	15	15	45	60			<u>.</u>	
Total,		10		6	16	109	185	294	140	•	140	
Waterford to Ballyhack, .	-		14	· .	14	T.						
" to Belfast, .									١.			
" to Duncannon,	1	204		271	476	6	8	14	١.			
" to New Ross, .		183	į .	346	529	6	3	9	<u> </u>	<u> </u>		
Total,	1	387	14	617	1,019	12	11	23	Ŀ			
Ballyhack to Waterford, .	4				4				38		38	
Belfast to Waterford, .									Ŀ	4	4	
Duncannon to Waterford,	440	235		1	676	210	458	668	1,507	5	1,512	
New Ross to Waterford	244	400		2	646	570	864	1,434	1,456	•	1.456	
Kilrush to Limerick, .	27	342		14	383	10	3	13	848		848	
Kildysart " .	2			4	6	1 .			99		99	
Kilkee "						١.	.		29	1	29	
Portumna			.			1 .			420		420	
Scariff , .									168	1	153	
Banagher " .			•			<u>  .</u>			351	<u> </u>	851	
Total,	29	342	-	18	389	10	3	13	1,900		1,900	
Greencastle to Greenore,		152		3	155	76	95	171	18		18	
Londonderry to Moville, .		6			6				2		8.	
Moville to Londonderry, .	9	268		5	282	78	77	158	17	8	25	
Belmullet to Sligo,	·	34		·	84	28	22	50	96	14	112	
Sligo to Belmullet.	·			•	. •		•			•		
Total, .	727	1,849		657	3,233	1,098	1,785	2,828	5,170	8 38	5,914	

## INLAND NAVIGATION.

during the Three Months ended 30th June, 1905, showing the Places and Debarkation.

at		Ног	rses.		Mules or		Total	
Goats.	Stallions.	Mares.	Geldings.	Total.	Jennets.	Авноя.	Animals.	Irish Ports.
.		•		•			26	Cork to Aghada Pier,
		•		•				" to Belfast.
.					.		7	" to Spike Island.
1			١.				3	" to Queenstown.
			3	3			3	,, to Waterford.
1			3	3	,	•	39	Total.
							348	Aghada Pier to Cork.
	.						5	Spike Island "
				•			22	Queenstown "
			·				75	Waterford "
	· .		•				450	Total.
						,	14	Waterford to Ballyhack.
٠ ا		2		2			2	" to Belfast.
	•	. 2	5 1	5 <b>3</b>		5	500	" to Duneannon.
<u> </u>					<u></u>		541	" to New Ross.
<u> </u>	<u> </u>		6	10		5	1.057	Total.
			•			•	42	Ballyhack to Waterford.
		•					4	Belfast to Waterford.
		1	1	2			2,858	Duncannon to Waterford.
	•	2		2			3,538	New Ross to Waterford.
		15	10	25			1,269	Kilrush to Limerick.
	•	•	•	.		.	105	Kildysart "
1 : 1		•	•	•	•	٠	29 420	Kilkee Portumna
	:			:			153	Scariff "
	.	•					351	Banagher "
•	•	15	10	<b>2</b> 5		•	2,827	Total.
		2	5	7		•	351	Greencastle to Greenore.
·					•		8	Londonderry to Moville.
. ]	•	•				•	460	Moville to Londonderry.
_ <u>·</u> _		•	1	1		<del></del> -	197	Belmullet to Sligo.
•	8	•	•	2		•	2	Sligo to Belmullet.
1	2	24	26	52		5	11.333	Total.

RETURN of the NUMBER of Horses Exported from IRELAND through GREAT BRITAIN to the Colonies and Foreign Countries during the Three Months ended 30th June, 1905, showing the Ports of Embarkation in Ireland.

					Number of Horses.							
National Control of the Control of t	Por	TS.			Stallions.	Mares.	Geldings.	Total.				
Belfast,					_	40	8	48				
Cork, .			•			1	-	1				
Dublin,						55	56	111				
Greenore,				.	-	487	235	722				
Waterford,		•	•		-	32	30	62				
Tota	al,	•	•		·	615	829	944				

RETURN of the Number of Horses Imported into Ireland through Great Britain from the Colonies and Foreign Countries during the Three Months ended 30th June, 1905, showing the Ports of Debarkation in Ireland.

						Number	of Horses.	
	Por	TS.			Stallions.	Mares.	Geldings.	Total.
Belfast,					_	7	14	<b>9</b> i
Dublin,	•	•	•	•	1	43	4	48
2	Potal,	•	•		.1	50	18	69

	CRE	<b>AMER</b>	y bi	JTTER	PRICE	STA	TISTICS.
--	-----	-------------	------	-------	-------	-----	----------

				Copenh To Quotat	no l	Manch	lester.	Lb. Rolls. In 24-lb. case. Per Cwt.			
	Wee endi			Kroner per 50 Kilos.	Shillings per Cwt. sp- proxi- mately.	Danish and Swedish Choicest.	Irish Oreameries Choicest.	Danish. Free on rail, London.  Cash wit	Irish. Carriage paid, Passen- ger Train. h Order.		
_				Kr.	8. d.	8. 8.	8. 8.	s. d.	s. d.		
June,	•	•	24.	89	99 11	105 to 107	98 to 100	112 0	109 8		
July,	•	•	1,	92	103 4	108 to 112	98 to 103	115 6	113 2		
"	•	•	క,	92	103 4	111 to 115	100 to 106	115 6	113 2		
,,		•	15,	92	103 4	111 to 113	102 to 105	115 6	113 2		
,,		•	22,	95	106 8	112 to 115	103 to 106	119 0	116 8		
"			29,	99	111 2	117 to 120	107 to 110	123 8	121 4		
August,			5,	101	113 5	120 to 124	112 to 116	126 0	123 8		
,,			12,	101	113 5	122 to 126	114 to 116	126 0	123 8		
,,			19,	101	113 5	122 to 124	114 to 116	126 0	123 8		
			26,	101	113 5	120 to 123	110 to 114	126 0	123 8		
Septemb	er,		2,	101	113 5	120 to 124	110 to 114	126 0	123 8		
			9,	101	113 5	120 to 122	110 to 114	126 0	123 8		
			16,	101	113 6	120 to 122	110 to 115	126 0	123 8		
,,	•	•	23,	103	115 8	120 to 124	113 to 116	128 6	126 0		

From Manchester prices, from 8s. to 10s. must be deducted in order to arrive at the net return to a Danish Creamery; and from 5s. to 7s. to get net return to an Irish Creamery.

Danish pound rolls are free on rail, London, wrapped in parchment and in cardboard boxes.

Irish pound rolls are carriage paid per passenger train, wrapped in parchment and in cardboard boxes.

If rolls are not packed in cardboard boxes, deduct  $\frac{1}{8}d$ . per lb. = 1s. 2d. per cwt.

An extra charge of  $\frac{1}{8}d$ , per lb. is made where cash does not arrive with order.

Carriage on pound rolls per passenger train is  $\frac{1}{2}d$ . per lb., excluding box; allowing for weight of box, carriage works out at 5s. 2d. to 5s. 8d. per cwt. of butter.

# ACCOUNT showing the QUANTITIES of certain kinds of AGRICULTURAL into Ireland in each WEEK from

				w	EEK END	ED	<del>-</del>	
ARTI	CLES.		3rd June.	10th June.	17th June.	24th June,	1st July.	
ANIMALS, LIVING-								
FRESH MEAT-			,			•	•	
Beef, Mutton,	:	. owts.	:	1,276 3,605	1,356	:		
SALTED OR PRESER	VED ME	AT-			1			
Bacon,		• cwts.	95	•	•			
Beef, Hams,	:	: "	82		:	. :		
Pork,			• -	190	200		220	
Meat, unenumer Fresh,	ra <b>te</b> a, t	SETTEN OF	. 1	29	. 1	. 1		
Meat preserved o				5	473		•	
salting,		Í		ð	1/5	•	•	
DAIRY PRODUCE AN				. 1		1	1	
Butter,	:	ewts.	158	174	i39	271	167	
Oneese		1				- 1		
Milk, Condensed, Oream,	•		51	18	31	19	39	
" Preserved.	ther kir	ıds "	: 1	:	:	:		
Eggs,	. 1	gt. hunds.	.		5,420	392	628	
LARD,		ewts.	.	63	91	.	55	
Corn, Grain, Meal	AND F	LOUR-	l			1	j	
Wheat,		. cwts.	183,000	238,200	85,400	200	130,800	
Wheat, Meal and Barley,	Flour	: "	5,200	15,300 21,400	1,200	9,000	4,700 17.500	
Quts,		. "	10,000		43,100		24,100	
Peas, Beans,	•	• "	20	20	230	70	120	
Maize or Indian C	lorn,	. "	104,800	287,400	232,300	223,300	81,100	
FRUIT, RAW-					J	}		
Apples, Currants,	•	. cwts.	:	:	:	:	•	
Gooseberries, .	·	. ",			:		48	
Pears,	•	, ,,	•	: 1	: 1	• 1	•	
Grapes,	:	. ,,		:		:		
Plums,	•	٠,,	•	•	•	•	•	
Strawberries	•	: ".		:	:	:	:	
Unenumerated,	•	. ,,	•	•	•	•	•	
IAY,	•	. tons	•	•	65	.	40	
TRAW,	•	• "	42	270	.	· _ ]	76	
MOSS LITTER, .	•	٠,,	124	41	.	54	34	
IOPS,	•	. cwts.	. 1	.	•	•	•	
Onions,		bushels	_ [					
l'otatoes, .	:	. cwts.	:	:				
Tomatoes, Unenumerated,	•	: "£	•	. 8	•		•	
Dried,		. cwts.	:	. "		: 1		
Preserved by Canr	ing,	. "	.	• }				
OULTRY AND GAMI	E	. £	.	. 1	.	. 1	.	
		l	1	]	1	1		

<sup>&</sup>lt;sup>9</sup> This Table is confined to the Imports of certain kinds of Agricultural Produce into to a request from this Department kindly consented to separate the Irish Imports (direct) form of Weekly Returns. It is hoped that the Department may soon be able to secure With these and such returns as the above, the Department will be in a position manufactured and agricultural products.

PRODUCE Imported direct (i.e. from the Colonies or Foreign Countries) 3rd June, 1905, to 26th August, 1905\*.

			WEE	K ENDED			
8th July.	15th July.	22nd July.	29th July.	5th August.	12th August.	19th August.	26th August
	•	•	•	•	•	•	•
:	:		:	2,250 1,400	:	. 55	:
		5	•			.	•
			•	•			•
400	200	67 301	•	471	:	245	•
•	•	99	•	•	981	•	1
182	216	206	199	234	. 273	221	. 2
. 9	- 51	73	- 56	. •	36	. 4	
. "	. 51		. 30	:	. 30	. *	
			•		•	•	•
1,832		1,269	•		2,199	1,309	•
250	.	•	95	•	91	•	•
352,000 5,100	153,600 6,000 25,000	89,800 13,000	47,300 6,800 27,200	32,600 10,900	137,400 3,400	42,500 4,900	326,6 4,5 5,7
34,500 120	16,500 60	10	180	20	40	40	٠ 1
252,700	290,600	205,900	253,500	405,700	300,000	217,000	515,4
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Ireland from the Colonies and Foreign Countries. The Board of Customs have manswer from those of the United Kingdom and to supply this Department with them in the roturns of Imports of all classes into Ireland which are re-shipped from Great Britain to rauge the economic dependence of this country on other countries for its supplies of

Statistics and Intelligence Branch,

Department of Agriculture

and Technical Instruction for Ireland.

#### AGRICULTURAL RETURNS OF GREAT BRITAIN, 1905.

PRELIMINARY STATEMENT for 1905, compiled from the RETURNS collected on the 5th June; and comparison with 1904.

CROPS.

DISTRIBUTION.		1905.	1904.	Incre	0.80.	Deor	886.
TOTAL AREA OF LAND A	ND WATER.	Acres. 56,787,669	Acres. 56,787,669	Acres.	Per Cent.	Aores.	Per Cent.
TOTAL ACREAGE under and GRASS.**	all CROPS	32,286,832	32,317,610	_		80,778	0·1
Wheat,		1,796,985	1,375,284	421.701	30.7	_	-
Barley		1,713,664	1,840,684	-	-	127,020	· 6.9
Oats,		3,051,376	3,252,962	_	-	201,586	6.9
Rye,		62,197	55,714	6,483	11.6	-	-
Beans,		254,765	252,782	1,983	0.8	-	
Pess,		175,235	175,608	-		373	0.9
Potatoes,		608,471	570,209	38,262	6.7		-
Turnips and Swedes, .		1,589,278	1,604,104	_	-	14,831	0.9
Mangold,		404,123	398,827	5,296	1.3		-
Cabbage,		67,758	64,607	3,151	4.8	-	-
Kohl-Rabi,		17,587	15,607	1,980	12.7	-	
Rape,		93,881	97,772		-	3,891	4.0
Vetches or Tares,	٠	136,429	128,229	8,200	6.4	-	-
Lucerne,		53,410	55,724	-	-	2,314	4.9
Other Crops,		106,120	100,947	5,173	5.1	~	-
Clover and Rotation ( Fo	or Hay, .	2,189,288	2,322,895	_		183,607	<i>5</i> ·8
1 G \	ot for Hay,	2,288,232	<b>2,8</b> 48,600		-	<b>60,36</b> 8	2.6
Total,		4,477,520	4,671,495	_	_	193,975	4.9
( Fo	г Нау.	4,688,520	4,765,403	_		76,883	1.6
Permanent Grass.*	ot for Hay,	12,511,974	12,332,653	179,321	1.8	-	_
TOTAL, .		17,200,494	17,098,056	102,438	0.6	_	_
Flax,		441	563	_	_	122	21.7
Hops,		48,968	47,799	1,169	9.4	-	
Small Fruit,		78,822	77,947	875	1.1		-
Bare Fallow,		349,818	432,690	-		83,877	19:3
Orchards,†	• •	244,323	243,008	1,816	0.5	-	_

<sup>\*</sup> Excluding 12,763,099 acres returned as Mountain and Heath Lund used for grazing in 1905, and 12,768,156 acres in 1904.

† The acreage of any Orop or Grass grown under the trees in Orchards is also returned under its proper heading.

PRELIMINARY STATEMENT for 1905, compiled from the RETURNS collected on the 5th June; and comparison with 1904—continued.

LIVE STOCK.

Distribution.	1905.	1901.	Incre	ase.	Decre	ose.
	No.	No.	No.	Per Cent.	Nο	Per Cent.
Horses used for Agricultural pur- poses,*	1,122,419	1,120,247	2,172	0.2		-
Unbroken Horses:—One year and above.	310,333	301,371	8,962	3.0	-	-
" " Under one year,	139,681	138,618	1,063	0.8	-	-
TOTAL OF HORSES,	1,572,433	1,560,236	12,197	0.8	_	
Cows and Heifers in Milk or in Calf, .	2,707,392	2,678,680	28,712	1:1	_	
Other Cattle: - Two years and above,	1,415,317	1,374,636	40,681	3.0	-	-
,, " One year and under two.	1,471,070	1,429,833	41,237	2:9	-	-
" " Under one year, .	1,393,241	1, <b>375</b> ,203	18,038	1.3	-	-
TOTAL OF CATTLE,	6,987,020	6,858,352	128,668	3.8	_	_
Ewes kept for Breeding,	9,935,766	9,880,908	54,858	0.6		_
Other Sheep:—One year and above, .	5,147,517	5,313,602	-	-	166,085	3.1
" " Under one year, .	10,173,913	10,012,668	161,245	1.6		_
TOTAL OF SHEEP,	25,257,196	25,207,178	50,018	0.2	_	_
Sows kept for Breeding,	835,008	382,056	-	_	47,048	12.3
Other Pigs,	2,089,911	2,479,588	-	_	389,677	15.7
TOTAL OF PIGS,	2,424,919	2,861,644	-	_	436,725	15:3

<sup>•</sup> Including Mares kept for Breeding.

BOARD OF AGRICULTURE AND FISHERIES. 25th August, 1905.

#### DISEASES OF ANIMALS IN IRELAND.

NUMBER of OUTBREARS of SWINE-FEVER, and Number of SWINE returned as having been SLAUGHTERED in Ireland, under the Diseases of Animals Act of 1894, in the undermentioned period, by Order of the Department.

							SWINE-FEVER.			
	Qua	erter e	nded				Outbreaks confirmed.	Swine Slaughtered as Diseased or as having been Exposed to Infection.		
June, 1905,	•	•	•	•	•		10	257		

NUMBER of OUTBREAKS reported as having taken place, and NUMBER of ANIMALS returned as having been attacked by ANTHRAX and GLANDERS in Ireland in the undermentioned period.

Ougster and od	ANTE	IRAX.	GLAN (includin		Epizootlo Lymphangitis		
Quarter ended	Outbreaks Animal Attacked				Outbreaks Reported.	Animals Attacked.	
June, 1905, .	1	1	3	10	6	9	

### NUMBER of Cases of RABIES in DOGS in IRRLAND during the undermentioned period.

		.Q	u <b>art</b> er	en <b>de</b> d	1		i	Number of Cases.
June, 1905,	•	•		•	•	•		Nil.

Number of Outbreaks reported as having taken place, and Number of Animals returned as having been attacked by Sheep-Scab and Parasitic-Mange in Ireland in the undermentioned period.

	Sheet	Р-ВСАВ.	Parasitic-Mange.			
Quarter ended	Outbreaks Reported.	Sheep Attacked.	Outbreaks Reported.	Animals Attacked.		
June, 1905,	43	574	86	113		

Veterinary Branch,
Department of Agriculture and Technical Instruction for Ireland,
Dublin.

#### EMIGRATION.

RETURN of the Numbers, Nationalities, and \*Destinations of the Passengers that left the United Kingdom for places out of Europe during the Month ended 31st August, 1905, and the Eight Months ended 31st August, 1905, compared with the corresponding periods of the previous Year.

		]	Br <b>it</b> ish	EMPIRE	l.		FOREIG	OUN COUN	TRIES.		Total for
Nationality.	British North America.	Austra- lia and New Zealand.	British South Africa.	India, includ- ing Ceylon.	Other British Colonies and Pos- sessions.	Total.	Uni <b>te</b> d States.	Other Foreign Coun- tries.	Total.	Grand Total.	corres- ponding Period of 1904.
				N	Ionth e <b>n</b> d	ed 31st .	August.				
English,	7,743	1,293	1,692	165	228	11,121	6,748	445	7,193	18,314	20,612
Scotch,	1,092	173	376	3 <b>3</b>	9	1,683	2,801	<b>6</b> 5	2,866	4,549	4,277
Irish,	409	98	116	2	5	630	4,353	23	4,381	5,011	7,296
Total of British origin.	9.244	1,564	2,184	200	242	13,434	13,902	538	14,400	27,874	82,185
Foreigners,	2,686	39	460	6	16	3,207	16,596	207	16,803	20,010	20,825
Nationalities not distinguished.	15	4	-	198	182	599	341	264	605	1,004	699
Total, .	11,945	1,607	2,644	404	440	17,040	30,839	1,009	31,848	48,888	58,209
Total for corresponding period, 1904.	8,402	1,854	2,902	299	543	13,500	38,992	717	89,709	58,209	
			THE STATE OF THE S	Eigl	nt Months	ended 3	lst Angı	ıst.			
English,	52,561	6,510	11,791	1,501	2,198	74,561	39.065	3,148	42,213	116,774	11263
Scotob,	11,346	961	2,685	114	97	15,203	13,090	372	13,462	28,665	24,659
Irish,	2,586	418	680	6	25	3,715	29,475	154	29,629	33,344	32,851
Total of British origin.	66,193	7,889	15,156	1,621	2,320	93,479	81,630	3,674	85,304	178,783	16964
Foreigners,	19,230	190	3,000	66	152	22,638	104,866	2,876	107,742	130,380	10587
Nationalities not distinguished.	32	4	-	905	1,373	2,314	818	1,709	2,527	4,841	4,111
Total, .	85,755	8,083	18,156	2,592	3,845	118,431	187,314	8, <b>259</b>	195,573	314,004	27963
Total for corresponding period, 1904.	69,954	7,848	19,464	2,680	3,848	103289	170589	5,807	176346	279635	

<sup>•</sup> The destinations given are, in all cases, based on the ports at which the passengers contracted to land. NOTE.—The above figures, being made up at the earliest possible date after the close of each Month, are subject to correction in the Annual Returns.

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### DEPARTMENT OF AGRICULTURE

AND

TECHNICAL INSTRUCTION FOR IRELAND.

## JOURNAL.

Meeting of the Council of Agriculture—The Vice-President's Address—National Need for Higher Commercial Education—Red Water in Cattle—"Stores" versus "Beef"—Practical Forestry—Parasites of Sheep—Prevention of Tuberculosis in Cattle—The Veterinary Congress at Budapest—Official Documents—Notes and Memoranda—Statistical Tables.

SIXTH YEAR.

No. 2.

**JANUARY**, 1906.



#### DUBLIN:

#### PRINTED FOR HIS MAJESTY'S STATIONERY OFFICE,

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PRICE SIXPENCE

#### CONTENTS.

,		Page
The Meeting of the Council of Agriculture,		209
The Vice-President's Address to the Council,		216
The National Need for Higher Commercial Education. By M.	E.	
Sadler,		233
"Red Water" in Cattle. By Professor A. E. Mettam, .		248
"Stores" versus "Beef." By Prof. James Wilson,		261
Forestry: The Planting of Waste Land,		270
" The Proper Methods of Planting Forest Trees, .		274
,, Trees for Poles and Timber,		278
,, Trees for Shelter and Ornament,		282
" The Planting, Management, and Preservation of Shelt	er-	
Belts and Hedgerow Timber,		286
" The Management of Plantations,		290
Some Common Parasites of the Sheep,		295
The Prevention of Tuberculosis in Cattle,		300
The International Veterinary Congress in Budapest,		305
OFFICIAL DOCUMENTS:		
Administrative,		310
	•	314
Agricultural,	•	325
Veterinary,	•	334
• •	•	204
Notes and Memoranda:		_
Meetings of the Boards, (p. 336). Irish Produce in British		
(p. 338). Nitro-culture Experiments (p. 339). Arterial D		-
Commission (p. 340). Importation of Canadian Cattle (p.		•
The Supply of Food in Time of War (p. 345). Cement Indu	-	
South-Eastern France (p. 346): Surprise Butter Competition		s in
1905 (p. 348), Local Science and Art Examinations (p. 351)	).	0.70
STATISTICAL TABLES,	•	370

#### NOTICE.

Communications respecting the literary contents of this JOURNAL should be addressed to the Superintendent of the Statistics and Intelligence Branch, Department of Agriculture and Technical Instruction for Ireland, Upper Merrion-street, Dublin.

Communications respecting Advertisements should be addressed to ALEX. Thom & Co. (LIMITED), MIDDLE ABBEY-STREET, DUBLIN; or to LAUGHTON & Co. (LIMITED), 1 ESSEX-STREET, STRAND, LONDON, W.C., and not to the DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

#### THE COUNCIL OF AGRICULTURE.

The eighth meeting of the Council of Agriculture was held on Tuesday, 14th November, 1905, in the Royal University of Ireland, Earlsfort-terrace, Dublin.

The Chair was taken at 11.15 o'clock, by the Right Hon. Sir Horace Plunkett, P.C., K.C.V.O., F.R.S., Vice-President of the Department.

The following were present:-

Representing the Department.—The Vice-President; Mr. T. P. Gill, Secretary; Professor J. R. Campbell, Assistant-Secretary in respect of Agriculture; Mr. George Fletcher, Assistant Secretary in respect of Technical Instruction; Mr. R. Cantrell, I.S.O., Chief Clerk; Mr. W. S. Green, Chief Inspector of Fisheries; Mr. J. S. Gordon, Chief Agricultural Inspector; Mr. W. Vickers Dixon, Senior Inspector for Technical Instruction; Mr. W. G. S. Adams, Superintendent of the Statistics and Intelligence Branch; Mr. J. P. Walsh, Clerk in Charge of Accounts; Mr. D. H. Lane, Inspector of Fisheries; Mr. D. S. Prentice, M.R.C.V.S., Superintending Travelling Inspector; Mr. J. D. Daly, Senior Staff Officer; Mr. T. Butler; Mr. J. V. Coyle; Mr. J. Hogan; Mr. A. Kelly; Mr. H. G. Smith; Mr. R. H. Lee.

#### MEMBERS OF COUNCIL, ACCORDING TO PROVINCES.

#### Leinster.

Robert A. Anderson; Gerald J. Brenan, J.P.; Algernon T. F. Briscoe J.P.; Stephen J. Brown, J.P.; Thomas J. Byrne, J.P.; D. J. Cogan, M.P.; Major J. H. Connellan, J.P., D.L.; William M. Corbet; William Delany, M.P.; James Donohoe, J.P.; Colonel Nugent T. Everard, J.P., D.L.; William Field, M.P.; Rev. T. A. Finlay, M.A.; Toler R. Garvey, J.P.; Patrick Hanlon; Walter M'M. Kavanagh, J.P., D.L.; Patrick J. Kennedy, J.P., M.P.; Nicholas B. King; James M'Carthy; James M'Mahon, J.P.; The Right Hon. The Earl of Mayo, K.P., D.L.; John J. Molloy, J.P.; George F. Murphy, J.P.; Charles H. Peacocke, J.P.; Henry Reynolds; William R. Ronaldson.

#### Ulster.

William Edmund Best; Rev. E. F. Campbell, M.A.; Alexander L. Clark, J.P.; Thomas Faloon, J.P.; Jeremiah Jordon, M.P.; John

Keenan, J.P.; Arthur S. Lough, J.P.; Francis J. Lynch; T. P. M'Kenna; H. de F. Montgomery, J.P., D.L.; George Murnaghan, M.P.; Colonel R. G. Sharman-Crawford, J.P., D.L.; William Smyth, J.P.; Captain T. Butler Stoney, J.P., D.L.; Thomas Toal, J.P.

#### Munster.

Richard Barter, J.P.; James Byrne, J.P.; Captain William C. Coghlan, J.P.; Maurice Connery, M.D., J.P.; Thomas Corcoran, J.P.; Thomas Duggan; Patrick J. Hogan J.P.; Jeremiah J. Howard, J.P.; Thomas Linehan, J.P.; William M'Donald; Patrick S. Mauning; Michael Mescal, J.P.; the Right Hon. Lord Monteagle, K.P, D.L.; Patrick F. Mullally, J.P.; Edmund Nugent, J.P.; Cornelius O'Callaghan; Alexander O'Driscoll, J.P.; Thomas Power; Hugh P. Ryan; John Ryan, J.P.; George F. Trench, J.P.

#### Connaught.

The Right Hon Lord Clonbrock, H.M.L.; Rev. T. C. Connolly, c.c.; P. J. Costello; John Galvin; Thomas G. Griffin; James P. MacGuire; Rev. P. M'Loughlin, P.P.; Daniel Morrin; Colonel John P. Nolan, J.P., M.P.; Edward P. O'Flanagan.

His Grace the Most Rev. John Healy, D.D., Lord Archbishop of Tuam, Member of the Agricultural Board, was also present.

Mr. J. D. Daly acted as Secretary to the meeting.

The Minutes of the seventh meeting, 9th February, 1905, a copy of which had been sent to each member of the Council, were taken as read, and were accordingly signed.

The Vice-President delivered his address.\*

The Council re-affirmed the arrangement made at previous meetings whereby the speech of a proposer of a resolution was limited to ten minutes, and the speech of a member other than the proposer of a resolution, to five minutes.

The Council had under consideration the following subject, which was submitted by the Department for discussion:—

The further development of county schemes: what steps are indicated by the experience of County Committees?

<sup>\*</sup> Printed at page 216, ct seq.

The following resolution was proposed by Mr. Stephen Brown, and seconded by Lord Monteagle:—

"That we desire to impress upon the County Committees of Agriculture and Technical Instruction throughout the country the great importance of a thorough organization, by means of local Sub-Committees and otherwise, of each county, especially in the rural districts, for the purpose of obtaining the utmost benefit from the opportunities provided under the Agriculture and Technical Instruction Act."

After considerable discussion, during which several important suggestions were made and noted, the resolution was put and passed unanimously.

The following resolution was proposed by Mr. Thomas Linehan and seconded by Mr. Jeremiah Howard:—

"That we request the Department to alter the present system of collecting agricultural statistics, which gives most unreliable results, and to substitute therefor a method similar to that adopted for obtaining the Census returns."

Mr. Linehan stated that in many instances the instructions issued with regard to the collection of statistics were not carried out by the Police, and he read a statement received from an enumerator as to practices adopted in filling up the returns. Mr. Linehan proposed as a substitute for the present system that the forms should be left with the farmers to fill up and return.

After some comments by members on the points raised, the Superintendent of Statistics stated that he did not believe that the alleged practices were general, but that he would be glad of an investigation on the point. He further stated that with regard to certain returns which were estimates there was difficulty in obtaining accurate information, and that the proposed change in the method of collection had serious disadvantages. He thought it desirable, however, that further inquiry should be made as to the best means of collecting the statistics, and he was quite prepared to recommend the Department to carry out from time to time independent tests in some districts with a view to checking the figures supplied by the enumerators.

The Vice-President said that the Department would undertake to inquire into the matter referred to by Mr. Linehan with a view to seeing whether any improvement could be made in the present system.

Whereupon Mr. Linehan asked leave to withdraw his resolution. The resolution was accordingly, by leave, withdrawn.

The following resolution was proposed by Mr. Linehan and seconded by Mr. Wm. M'Donald, and adopted:—

"That the Department be requested to keep a record of the the quantity and quality of the milk of each cow at the Albert Agricultural College and at the Munster Institute, at each milking, as well as of the mixed milk of the entire dairy herd."

At the request of the Vice-President, the Assistant Secretary in respect of Agriculture stated that a record of the quantity of milk was kept at both the institutions referred to. A test as to quality was costly, but the Department would consider the advisability of instituting such a test when they had a qualified man available for the work.

The following resolution was proposed by Mr. William Field, M.P., and seconded by Mr. H. de F. Montgomery, and passed unanimously:—

"That this Council approves of a practical effort being made to re-afforest suitable areas in Ireland; and that the Department appoint a Committee to advise them on matters relating thereto; and that the Treasury be requested to refund the monies arising from Irish Quit and Crown Rents as the nucleus of a fund for this purpose."

The following resolution was proposed by Mr. William Field, M.P., and seconded by Mr. Jeremiah Jordan, M.P.

"That, in view of the resolution unanimously passed by the House of Commons last session with respect to the immediate necessity of arterial drainage for Ireland, this Council enter into communication with the Chief Secretary to confer with him regarding a practical scheme to carry out said resolution,"

After some discussion, it was pointed out that a Viceregal Commission on arterial drainage had been recently appointed, and that two members of the Council of Agriculture—Mr. Stephen Brown and Right Hon. Mr. Andrews—were members of the Commission. In these circumstances it was felt that the subject should be postponed pending the issue of the report of the Commission.

Mr. Field concurred, and asked leave to withdraw the resolution.

The resolution was accordingly, by leave, withdrawn.

The following resolution was proposed by Mr. William Field, M.P.:—

"That as the present system of cheap through rates and high inland rates of transit injuriously affects agriculture and manufactures in Ireland, we request the Government to appoint a Viceregal Commission to inquire into and report upon the matter, with a view to utilise the suggestion made during the proceedings of the Financial Relations Commission, that a refund of the overtaxation should be granted by the Treasury to enable a reduction of rates and charges now levied by Irish railways."

After some discussion, the Vice-President suggested that M1. Field should amend his resolution by omitting all after the word "matter" in the fifth line.

Mr. Field accepted this suggestion, and the resolution, amended as follows, was put and passed unanimously:—

"That as the present system of cheap through rates and high inland rates of transit injuriously affects agriculture and manufactures in Ireland, we request the Government to appoint a Viceregal Commission to inquire into and report upon the matter."

The following resolution was proposed by Mr. William Field, M.P. seconded by Mr. Nicholas B. King, and passed unanimously:

"That this Council recommends the Government to bring in Bills compelling the identification of imported dead meat, and also to provide compensation to the owners of animals bought bona fide at full market price, but afterwards confiscated as being tuberculized."

The following resolution was proposed by Mr. Patrick Hanlon, seconded by Mr. William Delany, M.P., and passed unanimously:—

"That we request the Department to have another inspection of the stallions throughout the country made, so that a larger number of those of Irish draught blood may be selected; and that nominations be given for mares sent to horses of this class."

"That we also urge on the Department the great advantage that would be sure to result if they would start a stud of Irish draught horses on their farms." The following resolution was proposed by Mr. James M'Carthy and seconded by Mr. Mescal:—

"That the meetings of this Council are too infrequent for the due and prompt consideration of the many grave and important subjects—some of them of vital interest to the progress and welfare of the country—upon which it is supposed to advise; and that for the efficient discharge of its duties, we are of opinion that the Council of Agriculture should meet at least every three months."

Mr. Howard and others suggested that the meetings should be held at intervals of six months.

Mr. John Ryan proposed and Mr. Montgomery seconded an amendment to the effect that no change should be made in the existing practice.

The amendment being put was declared lost.

The Vice-President suggested that Mr. M'Carthy should amend the two last lines of his resolution so as to read—"should meet at least twice a year."

Mr. M'Carthy and Mr. Mescal accepted this suggestion, and the resolution, amended as follows, was put and passed without a division:—

"That the meetings of this Council are too infrequent for the due and prompt consideration of the many grave and important subjects—some of them of vital interest to the progress and welfare of the country—upon which it is supposed to advise; and that for the efficient discharge of its duties, we are of opinion that the Council of Agriculture should meet at least twice a year."

The following resolution was proposed by Mr. Arthur Lough, seconded by Mr. Linehan, and passed unanimously:—

"That the Department of Agriculture and Technical Instruction consider the advisability of providing farmers with expert advice in building new dwelling-houses and remodelling homesteads,"

"That they should supply standard plans and specifications free, or at a nominal charge, particular attention to be given to sanitary arrangements, and how best to utilise materials procurable about the farm or in the neighbourhood."

The following resolution was proposed by Colonel Nugent T. Everard, seconded by Mr. C. O'Callaghan, and passed unanimously:—

"That we call upon the Government to repeal the Acts of Parliament which prohibit the cultivation of tobacco in Ireland, and which thereby give an unfair monopoly of the industry to foreign countries.'

The following resolution was proposed by Mr. R. A. Anderson, seconded by Rev. E. F. Campbell, and passed unanimously:—

"That this Council desires to call attention to the recent rapid increase in the adulteration and fraudulent sale of butter, whereby the making of pure butter as an industry is being threatened with extinction. That we earnestly request the Department of Agriculture to urge upon the Government the immediate necessity for such legislation as will provide effective machinery for the detection of such frauds and to secure the adequate punishment of offenders, and that the co-operation of all Members of Parliament, representing agricultural constituencies, be invited in support of any Bill promoted with these objects in view."

The proceedings terminated at 6 o'clock.

# THE VICE-PRESIDENT'S ADDRESS TO THE COUNCIL OF AGRICULTURE.

My Lords and Gentlemen,—There stands upon the agenda paper, in the name of Mr. M'Carthy, a motion which, whether you adopt it or not, it will be very profitable to discuss. The law requires you to meet at least once a year. Mr. M'Carthy proposes that the Council should meet at least every three months.

QUESTION OF FREQUENCY OF MEETINGS OF THE COUNCIL.

This he considers necessary for the due and prompt consideration of many grave and important subjects, some of them of vital interest to the progress and welfare of the country. As the person chiefly responsible for deciding the frequency of your meetings, let me tell you the principle upon which I have acted. I have always been ready to summon the Council whenever there was reason to believe that you wished to meet, and I hope in the past I have rightly interpreted your wishes and consulted your convenience. The first Council met four times, and this is your fourth meeting.

The chief considerations you will have to take into account, when you are discussing Mr. M'Carthy's proposal, are the probability of securing a good attendance, a small attendance being most undesirable; the interruption of the work of many of the Department's officers, who have to prepare an immense amount of information in order to meet possible criticism; and the expenditure of public moneys in bringing delegates to Dublin from every county in Ireland. The cost of holding a meeting is, roughly, £300; a sum not lightly to be expended. Do not imagine for a moment that I have any doubt as to whether a meeting of the Council is worth £300. I am going to bring before you to-day one matter-the only subject which the Department has submitted for discussion-in regard to which, if you give the Department the assistance I am going to ask of you, it would not be long before the £300 was multiplied a hundredfold in the substantial benefits which would be conferred upon the country. I am also going to ask you to face boldly a great adverse fact seriously retarding our progress, and to give to the thought of the country a lead which, if taken, and I believe it would be taken, would hasten by decades the realisation of Ireland's economic hopes.

Before I submit the particular matter and the general matter which are to be the subjects of my address, let me in a very few words make answer to two fundamental questions upon which we must be agreed if our discussions are to have any logical sequence or practical effect.

OBJECTS OF THE DEPARTMENT AND THE VARIOUS BODIES CONSTITUTED UNDER THE ACT OF 1899.

My first question is—what is this new addition to Irish government—this Department with its Council and Boards, its Consultative Committee for co-ordinating educational administration, its thirty-three County, six County Borough, and seventy-three Urban District Committees, constituted to work with the central body—what is all this elaborate machinery intended to do for Ireland?—My answer is that its purpose is to assist in developing our agricultural and industrial life by providing practical education for the rising generation, and by assisting our workers by means of useful information and technical advice, illustrated and enforced wherever necessary by practical demonstration.

The second question is:—If that be our mission, what are the conditions to be supplied, and upon whom rests the responsibility for supplying them in order that that mission may be fulfilled?

### NECESSARY CONDITIONS FOR THE SUCCESS OF THIS ORGANISATION.

My answer is, that there are three principal conditions to be supplied:—Firstly, the efficient discharge of its functions by the Department; secondly, the active and sympathetic co-operation of the local authorities; and, thirdly, the fair and impartial attitude of public opinion towards the work in which the central Department and the local bodies are engaged.

#### DISCHARGE OF DUTIES OF CENTRAL DEPARTMENT.

(1.) Upon the first of these conditions, the way in which the central Department has done its work, I shall welcome, and do my best to meet, any criticism which you may see fit to make. I am glad that, owing to a somewhat unexpected course of public affairs, I have again to give an account of my stewardship to you, who have a moral as well as a legal right to demand it.

#### Co-operation of Local Authorities.

(2.) But I wish here to deal especially with the second condition, the relations of the local authorities to the Department, and with the division of labour which there must be between us. This subject is the most important in its immediate practical bearings and farreaching effects I have ever brought to your notice. For, remember, Gentlemen, that the policy of the Department has been throughout to decentralise as much of the work as possible. I do think we are gradually solving what I have before described as our chief administrative problem, viz., how far we can reap the advantage of stimulating local interest and evoking local effort without loss of administrative efficiency, which is, of course, more easily secured under central direction.

#### ASSISTANCE RENDERED BY SCHOOL AUTHORITIES.

Now so far as the school authorities are concerened, I can say that we have nothing to complain of. On the contrary, we have received far more assistance from them than we could have reasonably expected in view of the immense amount of trouble we were forced to give them in adjusting their arrangements to meet the requirements of our new educational programme, to say nothing of the sacrifice by hundreds of teachers of their summer holidays four years in succession in order to qualify themselves to teach that programme.

I shall give you presently some interesting figures which go to show that the happy relations which have been established between some primary, a great many secondary schools, and the Department, have been fruitful of excellent results; and this does not apply to any one part of the country or to any one denomination. It is generally true that the important work of introducing experimental science, drawing and domestic economy into the sceondary schools of the country has been made, if not an easy, at any rate a very pleasant task for the officers of the Department by the friendly and helpful spirit in which they have been met by those directing and teaching in the schools.

#### RELATIONS WITH COUNTY AND URBAN COMMITTEES.

Now in regard to our relations with the County and Urban Committees, a wholly wrong impression exists among those who see none of the work but read the incidents which the public press think worthy of notice. It should be remembered that, whenever a local

body and a central department are in disagreement, the public invariably side with the local body. And it must be admitted that on the evidence before it the public could hardly do otherwise. general grounds I do not think it is desirable for the members of any human institution to be always in the right, and I know it gets monotonous being always in the wrong. I have sometimes wondered whether it would not be for the public good that the Department should occasionally be unmuzzled, should make speeches and pass resolutions in the presence of the Press, criticising local bodies with the same freedom as is indulged in by local bodies criticising the Department. That, however, is, I suppose, not practical politics. But there are a few things I think I may say to you, who, both by your constitution and by your function, are clearly intended to criticise frankly and fearlessly not only the central but the local administrative bodies, and who, I am sure, desire to hold the scales evenly between them in the interests of the work. I have noticed that the relations between the local bodies and the Department vary enormously. Yet the principles of action and the procedure of the Department do not vary. From this I infer that the differences must be in the Committees and not in the central body. The truth is that the vast majority of schemes are working smoothly and well. On the Technical Instruction side of the Department's work difficulties were bound to arise under new Committees, composed for the most part of gentlemen who had no previous experience of educational administration, but who were, nevertheless, strongly interested in the movement. Obviously, nothing would have been easier than to leave these Committees to go their own way, but it would have involved a loss to Ireland of a large part of her share in imperial funds which we are trying-and, as I shall show you, not without success—to help Irish schools to earn. When we turn to the agricultural side of the Department's work, it is quite true that there was in the first year considerable friction between the central and the local bodies. Now there are occasional misunderstandings; but the real trouble is that in many counties the most is not being made of the money provided. This, in my opinion, arises from the want of a clear definition of the respective functions cf the central and the local administrative bodies.

### RESPECTIVE FUNCTIONS OF THE CENTRAL AND LOCAL AUTHORITIES.

I say functions, and not powers, as I wish to have the matter considered not as one of right, but simply from the point of view of

the greatest benefit to the country. It is true that the statute defines our respective powers, and, indeed, gives the Department a much larger control over the joint work than it ever exercises. Although we make the larger payment to the piper, the local authority, much more often than the Department, calls the tune. Now it seems to me to be a sound view, that the Department, with the support of this Council, and under the restrictions which the Boards can impose, should decide all questions which are of general as distinct from local import. Further, in formulating schemes where questions of educational or economic principle are involved, the central department must have the final say. Lastly-and this is the most important of all-it must be left to the Department to approve of the qualifications of the teachers and experts for local work. Upon the troubles to which the exercise of this function gives rise I shall have something to say presently. To the Local Committee should belong the selection of the schemes from among those approved by the Department, the appointment of qualified officers, experts and teachers for the local work, and the making of all necessary arrangements for carrying out the schemes- in short, the organisation of the work.

### VITAL IMPORTANCE OF PROPER ORGANISATION BY LOCAL COMMITTEES.

It is in the discharge of this last duty that the greatest improvement can, in my judgment, be effected. I never recognised how fundamentally important was this part of the local Committee's work until, in the absence through ill-health of a good many of the staff this summer, I was brought into closer touch than heretofore with many of those who are doing the local work. Gentlemen, the country is now provided with technical teachers and experts of high qualifications both on the practical and theoretical side, far in excess of any provision ever made before. I am confident that the benefits derivable from the services of these men could easily be doubled if the local Committees generally organised the people within their areas to profit by this instruction and advice. the function of the Committee to see that the objects aimed at in the several schemes, and that the benefits which they are designed to confer upon the people, are brought to the knowledge of the farmers in each district of the county. The selection of centres for classes and lectures, arrangements with school managers and schoolmasters for the use of rooms for lectures, heating and lighting the rooms, the formation of representative local Committees, the selection of a chairman for each night on which a lecture is to be delivered, the distribution of leaflets making known the object of the instruction provided, and generally arousing an interest in the Committee's schemes, are all duties which should be discharged through the agency of the local Committee. We have had difficulties with some County Committees because they wished to employ expert teachers in doing this organising work. I am sure that the Council agree that it would be a great waste of a teacher's time doing work which does not require expert qualifications. Our annual income from the endowment is now being fully expended. The work is growing rapidly, and so is the demand for technical training and advice. No greater economy, no greater addition to the efficiency of the work could be made than the enlistment of voluntary assistance for organisation and the keeping of the expert to expert work. In this connection let me add that a comparative study of the work of the County Committees brings out convincingly the importance of having a secretary who is able to take the lead in organising work. In a few instances, including such dissimilar cases as Cork, Down, Tyrone, and Wexford, the secretary of the County Committee spends a great part of his time going through the county districts, forming local Committees and generally assisting the people to take advantage of the various schemes. I know of cases where the secretary does not give his whole time to the Committee's work, and is closely tied to the county offices, and where, nevertheless, the organising work is well done, sometimes owing to the administrative capacity of the secretary, sometimes to the enthusiasm of the chairman. But these are exceptions. As a general rule, I think it is highly desirable that a whole-time officer should be appointed, and that as soon as he has proved his capacity to combine the functions of a capable organiser with those of a good correspondent and accountant, he should be paid a good salary. That, gentlemen, is, I think, all I need say on the subject of organisation. I tell you with conviction based upon experience that, if you can succeed in bringing home to the local Committees the importance of levelling up their organising work to that of the most successful counties, you will do the best of the many good days' work which, your critics notwithstanding, you have already done for the country. One very hopeful feature in the situation is that, if I were to perform the invidious task of placing the County Committees in order of merit according to the extent in which they had successfully operated the various schemes, you would find that, making due allowance for exceptional poverty, the honours would be fairly divided among the provinces.

(3.) I come now to the third of the principal conditions I have laid down, the attitude of public opinion towards our work.

ATTITUDE OF PUBLIC OPINION TOWARDS DEPARTMENT'S WORK.

Of this I make no general complaint. Considering that we are an Irish Government Department, we are treated considerately, and the practical recognition of the value of our work in the rapidly increasing rate at which it is being taken up is quite satisfactory. None the less, in a struggle against apathy, which is far more serious than active hostility, the ceaseless attempts to discredit the Department and its officers by reckless charges of jobbery, sectarianism and incompetence, undoubtedly tend to alarm and discourage the very classes whom it is most important to bring into touch with the Department's schemes. These charges cannot be met where they are made. I do not suppose any one expects me to spend my days in correcting statements made by anonymous and irresponsible persons, often without a shadow of foundation. If once you allow yourself to start on the task of replying to newspaper criticism, the moment you cease doing so and attend to your business, the anonymous fraternity, who, perhaps, have no business to attend to, triumphantly exclaim that they have silenced your guns. I do not wish to shirk the responsibility of my position for every act of the Department or its officers, but I will only answer to Parliament and to you, the loss of whose confidence I have many times stated publicly would lead to my resignation. Now I think it is right that I should do my best to strengthen the position of the Department and the local authorities in their joint work, by putting before you the facts which, I think you will see, give a complete denial to the two chief charges which the minor attacks are intended to drive home. Let me say here that I know that many people quite honestly and most reluctantly believe these charges, because they are not denied. The first charge is that there has been throughout and continues to be, an utterly unnecessary importation of non-Irish teachers and experts. The second is the sweeping charge that the cost of the Department's operations is enormous compared with the work which it has accomplished. With regard to the first charge. in my last address to you I said all I have got to say in favour of getting the best men for the work to be done.

## Allegation as to unnecessary Employment of Non-Irish Teachers and Experts.

But I think you will be glad to know the facts as to the employment of Irish and non-Irish teachers and experts respectively. It seems to be forgotten by our critics that most of the appointments which excite their wrath are not those of the Department at all but of the local Committees. The nationality of the successful candidates on the technical instruction side has not been inquired into; but the agricultural branch have, at my request, furnished me with the following facts as to the nationality of the experts employed by the County Committees.

#### AGRICULTURAL EXPERTS UNDER LOCAL COMMITTEES.

I find that during the past five years the County Committees, in their endeavours to supply themselves with itinerant instructors. have advertised for them both in Great Britain and Ireland. result we have, on behalf of the County Committees, examined for these appointments no fewer than sixty applicants from Great Forty-five of them we had to reject. All these men possessed degrees from a university where agriculture was taught, or held an agricultural diploma. Twenty-two Irishmen, twenty of whom had a technical training in agriculture under the Department, also presented themselves, and one only failed to pass—a significant answer to the allegation that the Department have forced the local Committees to employ non-Irish experts. In poultrykeeping forty-two instructors have been employed from time to time, of whom thirty-eight are Irish. The majority were trained by the Department. In horticulture and butter-making all who have been employed were either Irish or resident in Ireland before the Departwas established. Out of a total of 118 instructors employed since the schemes were put in operation fifteen only came direct from Great Britain. The wrong impression as to the strength of the non-Irish element in the service of the local authorities is far exceeded by the statements which are made about the central department.

#### STAFF OF TECHNICAL INSTRUCTION BRANCH.

A statement gained currency a short time ago to the effect that our Technical Instruction Branch was manned almost entirely by Englishmen and Scotchmen. The facts are, that out of eleven inspectors nine are Irish, while in the clerical staff I only know of one non-Irish officer, and as his name is Kelly I think we shall have

little difficulty in naturalising him. On the agricultural side, those who were responsible for manning the Department with experts had to deal with a situation which, I should think, was quite unique in any European country.

DEARTH OF TRAINED IRISH AGRICULTURAL EXPERTS.

In spite of the fact that we relied on what was generally called our single industry, there was in the country a complete dearth of men who were not only practical farmers, but who were also versed in the sciences underlying agriculture, and familiar with the modern educational methods by which that industry has been advanced in every country which competes with us. And outside Ireland we were able to find only two Irishmen highly qualified in these respects, each of whom we succeeded in bringing over from a high position in this work in England. For the rest, the only course open to us was to get the best men we could find who had been in this work, and throw upon them the task of simultaneously starting the work of agricultural development in Ireland, and as rapidly as possible training Irishmen to carry it on. If I could have followed my own inclination I would have spared absolutely no expense out of the Department's endowment to train such men in the early years, but the fact is that there was no demand for their services; and even to-day, in going round County Committees, I have heard doubts expressed by men of great agricultural experience and influence as to the value of the services of an itinerant instructor-an officer upon whose essential importance to the general progress of our work I have on former occasions dwelt, I fear, ad nauseam.

#### ALLEGATION AS TO LARGE EXPENDITURE WITH SMALL RESULTS.

I come now to the other general charge—high expenditure, chiefly upon salaries, combined with poverty of results. As regards salaries, that is a matter for the Treasury, and if we, who were new to official life, have succeeded in bamboozling My Lords Commissioners into giving us a staff out of proportion to the work, and paying them salaries in excess of their duties and responsibilities, I really think some credit might be given to us for our ingenuity. The staff has increased, but certainly by no means in proportion to the work. Until the contrary is proved, I maintain that the salaries paid in this Department are on a lower scale than those of any Department performing analogous duties in any part of the

United Kingdom. But, after all, the important question is, what is there to show for the expenditure? I do not propose to describe all the Department's functions, although I do say it is absurd for any man to express an opinion as to the relation between expenditure and results when his calculation is based merely upon an arithmetical treatment of the officers and their salaries, combined with a total ignorance or suppression of all facts as regards results.

I will limit myself here to what I may call the new work of technical instruction and agricultural development. I pass by the work of central institutions directly under the Department: this work is growing enormously, but I wish to-day to concentrate your attention upon the operations in which you yourselves are taking an active part, and which I am asking you in certain ways to try to advance.

### FIGURES SHOWING GROWTH OF DEPARTMENT'S WORK SINCE ITS FORMATION.

I have had charts prepared and put upon the walls to enable you to follow me with ease. I know that a mere statement of figures would be utterly wearisome, and leave no effect upon your mind beyond one of bewilderment.

(The Vice-President then read to the Council the figures given in the Appendix below, as to the growth of various branches of the Department's work.)

That, gentlemen, is the story, not of our work alone, but of the country's work with us all. These cold facts and figures eloquently justify the honest, earnest work done for Ireland by thousands of men and women, who, through good report and evil report, are building, building.

#### NECESSITY FOR SOUND FOUNDATION.

It is foundation-laying it is true, but the foundations are being well and truly laid. I have heard it said by those who employ a metaphor more appropriate to our work—"You ask to be known by your fruits; we see no fruits." Well, we have some fruits to show. But now, and for some years to come, our work must be known chiefly by its roots, and, alas! in these feverish days no one seems to care about roots except those whose impatience fills them with a desire to pull them up and see how our young plants are growing. You who take a keen interest in the work know what a handicap it has been to us that, before we could make any rapid

progress in training our young people to meet the demands of modern industry, we had to train those who were to train them.

I hope I have satisfied you that the work is going on steadily and soundly. We can easily possess our souls in patience if we have your confidence. If, as the result of to-day's discussion, you see your way to recommend the local Committees, especially those whose operations are spread widely over the rural districts, to consider carefully during the winter months how they may best organise the people for the economical and efficient administration of the schemes, and if you will give to the country the feeling that you are alive to your duty of criticising unsparingly but justly the work for which I have over and over again acknowledged my chief responsibility to you, I feel that you will have established yourselves and your successors in a position to do great practical good to the country, and that you will exert upon public opinion a moral influence of incalculable value.

#### APPENDIX.

#### AGRICULTURAL BRANCH.

#### TABLE No. 1.

#### ITINERANT INSTRUCTION IN AGRICULTURE.

Showing the number of Counties who employed Instructors under

	unis	scheme	ior	tne	past	uve	years.	
Year.					•		J	No.
1900-1,								3
1901-2,								10
1902-3,								10
1903-4,								17
1904-5.								90

#### TABLE No. 2.

#### ITINERANT INSTRUCTION IN POULTRY-KEEPING.

Showing the number of Counties who employed Instructors under this Scheme for the past five years

		NO CER GENE	 	P	** * *	A CONT D.		
Year.				•		•		No.
1900-1,			•			•		3
1901-2,						·		12
1902-3,								22
1903-4								32
1904-5,	,					_	·	30

#### TABLE No. 3.

#### ITINERANT INSTRUCTION IN BUTTER-MAKING.

Showing the number of Counties who employed Instructors under this scheme during the past five years.

Year.					No.
1900-1,					1
1901-2,					4
1902-3,	_				11
1903-4,					18
1904-5	-	•	•		22

#### TABLE No. 4.

#### ITINERANT INSTRUCTION IN HORTICULTURE.

Showing the number of Counties who employed Instructors under this scheme during the past five years.

Year.				No.
1900-1,				
1901-2,		•		1
1902-3,				9
1903-4,			•	14
1904-5,				21

#### TABLE No. 5.

#### AGRICULTURAL CLASSES.

Showing the number of classes held, and the total number of pupils who attended same during the past three years.

Year.	No. of Classes.	No. of Pupils,
1902-3,	<b>2</b>	48
1903-4,	7	161
1904-5.	18	317

#### TABLE No. 6.

#### EGG STATIONS.

Showing the number of Stations established for the distribution of settings of eggs of pure breeds, and the number of settings actually distributed, during the past five years.

Year.	No. of Stations.	No. of Settings.
1900-1,		
1901-2,	36	4,108
1902-3,	220	18,040
1903-4,	392	40,857
1904-5,	462	49,000

#### TABLE No. 7.

#### PRIZES FOR COTTAGES AND SMALL FARMS.

Showing the amount expended from the joint funds through County Committees on prizes for cottages and small farms.

Year.				Amount.
1900-1,				£466
1901-2,				£1,398
1902-3,				£2,952
1903-4,		•		£4,655
1904-5.				£4,983

#### TABLE No. 8.

#### EXPERIMENTAL AND DEMONSTRATION PLOTS.

Showing the number of Experimental and Demonstration Plots established during the last five years.

Year.	Experimental Plots.	Demonstration Plots
1900-1,	1 (016)	
1901-2,	150	300
1902-3,	304	500
1903-4,	309	974
1904-5.	461	1,664

#### TABLE No. 9.

#### SEED TESTING.

Showing the number of samples of seed forwarded by farmers in the country for testing at the Department's Seed Testing Station during the past five years.

Year. 1900-1,		•	No. of Samples. 387
1901-2,			. 488
1902-3,			. 712
1903-4,		•	. 1,041
1904-5,		,	. 1.536

#### TABLE No. 10.

#### HORSE-BREEDING SCHEME.

Showing the number of registered stallions in connection with the above Scheme during the past five years.

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Year.	Thoroughbred.	Agricultural.			
1900-1,	97	31			
1901-2,	111	51			
1902-3,	123	69			
1903-4,	140	71			
1904-5.	154	75			

#### TABLE No. 11.

#### Horse-Breeding Scheme.

Showing the number of nominations awarded to selected mares in connection with above Scheme, and the actual expenditure from the Joint Fund during the past five years.

Year.	No. of Nominations.	Amount.
1900-1,	1,5 <b>4</b> 4	£4,632
1901-2,	2,343	£5,831
1902-3,	2,594	£6,234
1903-4,	3,044	£7,158
1904-5,	<b>3</b> ,503	£8,289

#### TABLE No. 12.

#### CATTLE-BREEDING SCHEME.

Showing the number of premiums actually awarded to Bulls in connection with the above Scheme, and the amount actually expended from the Joint Fund during the past five years.

Year.	No. of Premiums,	Amount paid.
1900-1,	350	£4,039
1901-2,	424	£5,656
1902-3,	618	£9,186
1903-4,	734	£10,517
1904-5,	800	£12,000

#### TABLE No. 13.

#### SWINE-BREEDING SCHEME.

Showing the number of premiums actually awarded to Boars in connection with above Sheeme, and the amount actually expended from the Joint Fund during the past five years.

Year.	No. of Premiums.	Amount paid.
1900-1,	151	£752
1901-2,	154	£726
1902-3,	181	£878
1903-4,	129	£624
1904-5,	205	£845

#### TABLE No. 14.

#### Subsidies to Shows.

Showing the number of Shows subsidised by County Committees and the total amount paid in subsidies during the past five years.

		I			- 1 J.
Year.		No. o	f Shows.		Amount. £4,384
1900-1,		61			
1901-2,		81			
1902-3,			121		£ $6,239$
1903-4,			123		£6,384
1904-5,			126		£ $6,539$
TE	CHNICA	L INST	RUCTION	BRAI	NCH.
	I. DA	y Seconi	DARY SCHOO	DLS.	
1901-2,			•		. 154
1902-3,					. 196
1903-4,					239
1904-5,		•			257
1905-6,	•		•		. 267
II. 7	<b>FEACHERS</b>	ADMITTE	D TO SUMM	er Cou	RSES.
1901,					. 276
1902,			•		. 455
1903,			•		. 643
1904,					. 813
1905,			•	•	. 838
III. PAY	MENTS TO	TECHNIC.	AL INSTRUC	TION C	OMMITTEES.
(Ot	her than	County .	Borough Co	mmitt	ees)
1901-2,				•	£6,536
1902-3,			•		£21,084
1903-4,					£32,134
1904-5,	•		•		£34,419
IV. Schol	ARSHIPS	AT THE	ROYAL COL	LEGE O	F Science.
1901-2,			•	•	. 23
1902-3,			•		. 38
_,					

(Note.—These figures include Agricultural Scholarships as well as those given by the Technical Instruction Branch.)

46

73

69

1903-4,

1904-5,

1905-6,

V Science	E AND	ART	GRANTS	(Pari	LIAMENT	ARY VOTE).
1901-2,						£10,475
1902-3,						£20,860
1903-4,						£26,593
1904-5,				•	•	£29,389
VI. STUDES	TS AT	TENDI	ng Тесн	NICAL	School	s and Classes
Urban Schem	cs			•		
1901-2,						11,465
1902-3,					•	16,081
1903-4,						16,984
1904-5,				•		17,538
County Schen	168					
(a) Permana	ent Cen	tres.		•		
1901-2,			÷		tigures	not available.
1902-3,						4.224
1903-4,						5,311
1904-5,		٠				6,040
(b) Hincrant	Instru	iction.				
1901-2,					figures	not available.
1902-3,						9,208
1903-4,						17,103
1904-5,						16,506
VII. SCHOLAR						HOOLS TENABLE
	AT ]	DAY S	ECONDAR	у Scн	DOLS.	
1902-3,	•	•	•	•	•	
1903-4,						43
1904-5,		٠				. 97
1905-6,	•	٠		٠		. 182

VIII. Last of the more important Technical Schools established under the Direction of the Department.

Town.				Students Enrolled, 1904-5.	Town.				Students Enrolled 1904-5.
Waterford (1),				809	Wexford,	•			240
,, (2),	•			138 (1903-4)	Tipperary,	•	•		240
Ballymena,				440	Tralee, .			. 1	234
Lurgan (1),			. •	235	Clonmel,				214
,, (2),				178	Kilkenny,				214
Newry, .				396	Newtownards,			. :	212
Dundalk, .				370	Bray,				210
Kingstown, .				342	Blackrock,				204
Ballsbridge,				342	Drogheda,				204
iligo, .				337	Holywood,				164
Rathmines.			. !	320	Dungannon,				162
Coleraine,			. !	302	Queenstown,			. :	160
Banbridge, .				290	Bandon, .			. :	159
Portadown,			. ;	285	Omagh, .			. !	142
Larne, .				277	Strabane,				141
Bangor,			. 1	257	Fermoy,			. !	. 133
Armagh, .				240	Cookstown,			. 1	132

1X. LIST OF SCHOOLS AND CLASSES WORKING UNDER THE DEPARTMENT.

Type of School or Class.	Number.	
A.—Primary Schools (Drawing and Manual Instruction	), .	92
B.—Day Secondary Schools,		262
C.—Day Trade Preparatory Schools,		6
DResidential Schools of Domestic Training, .		6
E.—Central Institutions,	•	3
F.—Urban Technical Schools,		69
G.—Permanent Centres of Instruction in Rural Distric	ts, .	43
H.—Itinerant Instruction Courses (Session, 1904-5), .		617
I.—Science and Art Schools (not included in F. and G. a	bo <b>ve</b> ),	24
K.—Centres of Industrial Training,		101
Total Centres of Instruction, .		1,228

# THE NATIONAL NEED FOR HIGHER COMMERCIAL EDUCATION.

Based upon an Address delivered at the Annual Meeting of the Rathmines School of Commerce on the 23rd October, 1905.

What, we may ask, are the causes which have led to the new, and now world-wide importance of the question of commercial education? It has come to the front, as these things generally do, rather in opposition to many old-established and privileged educational influences than by any special favour or support of them. It has been pushed forward by far-seeing and public-spirited men of business who are convinced by their reading of the facts of our time and by their instinctive perception of new economic opportunities that there is value to be gained from making use of the power of scientifically adjusted education in the sphere of commercial activity as well as in other departments of modern life. The spirit of the time is at work in the new and most promising developments of commercial education. Yet what depressing associations of dreary ineffectiveness still hang about the phrase.

The need of true We can all remember rather squalid and Commercial Education ill-taught seminaries which professed in their

humbly pretentious prospectuses to give "a sound commercial education." What they gave was, as a rule, poor and lifeless stuff-an arid course of punctilious penmanship, meagre English, headless arithmetic and desiccated geography. It was the mere remainder biscuit of a "modern" education. The consumption of this sorry fare was enforced by the cane, when not avoided by healthy idleness. The one saving fact in the situation, and that only in a few fortunate cases, was the vigorous personality of the instructor, who left his mark on his pupils by what he was and what he did rather than by what he intelligently knew. I remember such a one, whose hot temper, quick hand and ready tongue gave to his ministrations an educational value of which they would otherwise have been destitute. On the intellectual side what was given was so sterile and unstimulating, so lacking in power of cultivation, so remote from anything that appealed to the imagination that the whole business became a bye-word. But in its new and highest form commercial education has a very different significance. It has definite aims, and employs skilful methods to

The Functions of Higher Commercial Education.

achieve them. Its purpose is first and foremost to enable those who intend to enter upon a commercial career, or who are already engaged in an initial stage of it, to gain a broad outlook over the economic problems involved in their work. Secondly, its pur-

pose is to train the mind to analyse with quick insight and scientific precision the complex factors—psychological, it must always be remembered, as well as technical—which make up a new economic Thirdly, its aim is to place at the disposal of the students (and especially at the disposal of those who are already engaged in commercial work, and therefore realise its practical conditions and their own needs), what may be called the capitalised experience of workers in the sphere of modern commerce in its manifold developments. This capitalised experience is what many of the keenest-witted beginners and (if I may use the word) risers in business know that it most concerns them to gain, but it is just this that in many cases they find it almost impossible to get. Oldham, in his account of the Rathmines School of Commerce, quotes some pithy words of that remarkably gifted man of business, Mr. Arthur Chamberlain on this very point. Mr. Chamberlain was speaking of the instruction given in the faculty of commerce at the University of Birmingham. "Such knowledge as the foregoing," he said, "is what is required in business, and is usually only learnt bit by bit, at a heavy cost, so that the man of business has generally reached the limits of his working life before he has completed his commercial education; and, owing to the want of a codified system, business men continue from generation to generation to renew the mistakes of their predecessors and to repeat their experiments, and after much tribulation to re-arrive at their methods, their rules and their conclusions." In short, though, of course, no business can perpetuate its methods in any hard and fast shape it may nevertheless be urged that there is room and need for a formulated tradition of business methods which can be educationally transmitted, and in the imparting of which trained educational skill and comparative knowledge of different kinds of practice have scope for fruitful exercise. The published works on trade and economic subjects, the periodical literature devoted to the several branches of commerce and the statistical and commercial

papers issued by Government and other public bodies all furnish material for the study. In trade associations and generally there forms and perpetuates tradition of practice. The School ofCommerce. however, supplements this by oral instruction on systematic lines, by co-ordinating published information, and by throwing the theory of the subject into a systematic form with due regard to the practical needs of the learners. But it is to the first and second of the aims of higher commercial education, even more than to the third, that I would call your attention. The capitalised experience of other business men needs discriminating power on the part of the man who would profitably apply it. And he will apply it best who brings to the task trained insight into business conditions and a wide outlook over the tendencies of commercial effort. Those who have visited the battlefield of Gettysburg, where during three days was fought with heroic courage on both sides the initial struggle of the American Civil War, will remember what they gained by standing on the high tower on the ridge and looking over the whole range of country in which the fateful struggle took place. In the same way the young student of business gains from an opportunity of surveying the wide field in which the commercial efforts of modern times are being carried on. In his own house of business it is inevitable that he should often find himself confined to a somewhat narrow intellectual groove. He is immersed in the details of the daily work of his department. What he needs is a chance of attaining a standpoint from which, while still young, he may survey the wide field of commercial activity and, with skilled assistance at his command, watch the movement of the great economic forces which are shaping commercial opportunities and which indicate the tendencies of modern commercial enterprise. This is the opportunity and this the guidance which can be given to the young business man of talent and energy by means of the best kind of higher economical education.

The conviction, shared by so many of the most prescient leaders of modern commerce, that an education of this kind has become a valuable factor in the business equipment of a commercial community is due, I think, to three main causes.

First, the collective power of the State seems destined to play a part of increasing importance in the economic policy of a nation. By timely experiment, by temporary guarantees, by subsidies in aid of works of public benefit, by educational policy and by diplomatic

action, the State may further the economic interest of the whole community. Perhaps the greater part of such action may most safely be confined to the removal of economic inertia or of ignorance, or of psychological or political obstacles to the advance of the national well-being, but the results of the action, where successful, are positive. I do not mean to imply that in the economic development the national unit will tend to supersede the individual or the voluntary combination of individuals. On the contrary, the effectiveness of national effort will depend upon individual and corporate enterprise growing in at least an equal degree in alertness and strenuousness of initiative. But can anyone review the present situation without remarking the effective part which, in certain conditions and conjunctures of affairs, the national power may play in furthering the commercial enterprise of the community, and in thus helping to secure benefits for the population at large? illustrations of this tendency, I would cite the steps taken by the German Government for the encouragement of shipping lines; the action of the Danish Government in developing by technical education and organisation the export trade in butter and other farm produce; the assistance given by the British Government towards cotton-growing within the Empire, and in other respects, educational and economic, the State, in this country, increasingly important functions. due balance The national effort and of voluntary enterprise in commercial development is one of the most important practical questions in modern politics. Excess in the direction of laissez faire or of national control is certain to be attended by evil consequences, but a just combination of the two forces is fruitful and efficacious. In order that such a combination may be attained, and with due adjustment maintained, it is necessary that there should be widely diffused through the community a high standard of commercial science, based upon a scientific grasp of economic conditions and possibilities. The changing conditions of the time make it expedient to throw a large proportion of commercial experience into joint stock, where it is more available for common use and for development, through criticism and further investigation, than when it remains the more exclusive possession of individuals or of groups of individuals intimate through membership of a common market. The highly-instructed officials, whose labours form a necessary part in carrying out a national policy of commercial development, need to have in the community outside

a large body of watchful opinion, versed in commercial science and habituated to think of the national as well as of the purely self-regarding or the more individualistic aspects of trade policy. In such a body of highly-trained outside opinion the State finds moral support in the execution of far-seeing plans which involve temporarily unremunerative outlay; it finds in it also a tribunal for expert reference and consultation, and at the same time a check upon any unwholesome growth of official interference. What, in short, is being brought about is a new attitude of mind on the part of the commercial and industrial classes towards an intelligent co-partnership of national and independent effort in the economic development of national resources. In this process, the wider view which is promoted by higher commercial education is a factor of high importance.

Another cause of the growing importance of this branch of

The increasing need of a wide Commercial knowledge. education lies in the fact that men of business to-day have to deal with a far wider range of facts, with a more complicated variety of facts, and with more rapidly-changing commercial situations than their predecessors had a generation ago. Ac-

celerated means of communication have brought distant markets within the effective reach of a number of producing centres. changes have become more intricate and interdependent. new markets have been opened up. Competition is more penetrating and more keenly pushed. Moreover, demand has become more mobile and changeable. One result of the diffusion of improved elementary education and of the development of secondary education on popular lines in so many parts of the world has been the quickening of new tastes, and the acceleration of the cycles of The trade conditions thus altered have necessifashion-change. tated a higher standard of general commercial knowledge among the business classes. Especially marked is the requirement of a better equipment of general education, and of a more accuratelyinformed knowledge of world conditions among the travelling representatives of commercial firms and the firms' confidential advisers at home.

To these causes should we not add a third? Through the new applications of science to methods of production and distribution success in the higher commercial callings now demands an

intellectual and scientific preparation-first general and then technical-comparable to that which is required for eminence in the older professions.

This leads me, however, to lay stress upon the fact that the only

If Commercial Education is to be Education must be thorough.

sound basis for higher commercial education, as indeed for all other forms of higher professional training, is found thoroughly efficient system of elementary successful, Elementary and intermediate education. And in both those grades of education direct instruction by competent teachers is but one of the factors which have to be kept in view.

is indeed an indispensable factor, but by no means the only one necessary to educational efficiency. Perhaps the gravest weakness' in some modern systems of education is that they over-instruct the pupils-in some cases attempting too many subjects to allow mastery to be gained in any of them; in other cases imposing upon the pupils too heavy a burden of lessons, and thus overtaxing their physical strength, and allowing too little scope for individual interest to develop and to gather necessary sustenance. The physical development of the pupils calls for watchful care, and may easily be injured if excessive demands are made by examinations and by purely mental work, especially during the critical years of adolescence. In how many cases do we not find that an energetic and vigorous man can ascribe a good deal of his mental keeness in later life to habits of diligent idleness during part of his Moreover, that is a perverted form of education school days? which reduces the pupil to the position of one into whom information is poured and which does not train him to work for himself and to learn not from books only, but by doing things, by experimental and practical work, and by bearing a vigorous and responsible part in activities outside the class-room. It is the business of a good school to form independence of character as well as habits of intellectual precision, and to stimulate personal initiative as well as cultivating the power of assimilating what is given in the form of direct instruction.

The facts point to the clear conclusion that no plan of higher commercial education can be successfully carried into effect except where the students have already received an invigorating general education in well-staffed and competently-organised Secondary

schools. Similarly, commercial education of a lower grade fails of its purpose unless it be based upon the intellectual groundwork of a thorough elementary education.

It is in accordance with these facts that the most effective de-

The lesson of Continental experience.

velopments of commercial education have taken place in those countries which had previously equipped themselves with well-organised systems of Elementary and Secondary schools. In Germany and in

Switzerland commercial education is more scientifically organised than elsewhere, and in each case it rests upon the intellectual substructure of careful elementary and secondary training.

In proportion to the size of the country, Switzerland has taken the lead in the furtherance of commercial education. It has already more than fifty well-organised commercial schools, and this number is constantly increasing. In these schools special attention is paid to the teaching of languages. Commercial geography, accountancy, business methods, political economy, commercial law, and the study of the materials of commerce form the course of instruction. The associations of merchants have taken an active part in the establishment of these schools, which receive Government subsidies in addition to the income derived from students' fees and private contributions.

All over Germany the movement for commercial education is rapidly advancing. Commercial classes, established in many cases by unions of commercial men, are found in every town. municipalities also are providing in the public continuation schools instruction in commercial subjects. The fundamental idea of German educational policy is that the task of the Elementary and of the Secondary school is to give a general education, and then specifically technical or professional training is wisely postponed until the pupil's general education is complete up to the limit which is possible within the period of school life covered by the Therefore, commercial education is organised school in question. in a manner supplementary to that given in the elementary and secondary schools respectively. For the most part it is given in evening classes, which can be attended by pupils who are at work in the daytime, but there is an increasing tendency in Germany for business firms to encourage their younger employés to attend continuation classes in the daytime on one day in the week, and in many cities the local regulations require such permission to be given.

Outstanding, however, among the multitudinous efforts for com-

The Aim and Policy of German Commercial High Schools. mercial education in Germany are four High Schools of Commerce at Leipzig, Cologne, Frankfort-on-Main and Aachen. These are grappling with the problem of commercial training for the future leaders of commerce, not simply with that of im-

proving the technical equipment of the subordinates who occupy humbler positions and are unlikely (save in exceptional cases) to rise to places of the highest responsibility. These High Schools of Commerce have aims which are well defined in the programme of that at Frankfort.

- (1.) To equip persons connected with industry and commerce with that range of information on social and commercial sciences which is required for the full discharge of the duties attached to leading positions in the business world.
- (2.) To give an opportunity to other persons (and especially to those who are already engaged in business) to widen and deepen their knowledge of economic, social and commercial questions.
- (3.) To meet the needs of teachers who wish to improve their qualifications for giving instruction in trade schools and continuation classes.
- (4.) To provide the higher officials of the civil and municipal services, magistrates, and other members of the learned professions with an opportunity for the deeper and wider study of social and economic problems, and so to promote insight into the significance of economic activity, and at the same time to furnish commercial information and general instruction on subjects connected with the carrying on of industrial operations.

The aims of the Leipzig High School of Commerce are thus stated:—

- (1.) To give a thorough general and commercial education to young men who intend to devote themselves to a commercial career.
- (2.) To provide those who intend to be teachers in commercial schools with an opportunity of prolonging their special preparation, theoretical and practical, necessary for their professional efficiency.
- (3.) To afford to business men the means of enlarging their knowledge of particular branches of commercial science and commercial practice.

At Aachen, where the School of Commercial Science is one branch of the famous Technical High School, the aims are stated thus:

To provide a form of academic training in the commercial sciences which cannot be obtained either at the universities on the one hand, or at a strictly Commercial High School on the other.

Primarily the course is intended for those who will in future become the principals of great commercial firms or industrial establishments, but also (1) for business men who wish to prepare themselves for the conduct of the economic affairs of the nation in commercial associations; (2) for those who will in future become the officials of Chambers of Commerce, etc., and (3) for university-trained teachers who wish subsequently to attach themselves to the teaching staff of an institution for commercial education.

At Leipzig there are 45 teachers on the staff of instructors; at Aachen, 26; at Frankfort over 20; at Cologne, 31. In the first case twenty-eight of the teachers are also Professors at the University of Leipzig. At Aachen nine are Professors at the Royal Technical High School, an institution of university rank. At Cologne, nine are Professors at the University of Bonn. At Frankfort the staff includes Professors from the Universities of Giessen and Heidelberg. This connection between the Commercial High Schools and the Universities is significant and valuable.

In all cases it is required that the students shall have received

Entrance
Qualifications
in German Schools
of Commerce.

before entrance a good general education. At Aachen the conditions are the most severe, admission being limited to young men who have passed through the full nine-year course of a higher Secondary school.

At Leipzig admission is also granted (1) to

male Elementary school teachers, trained at a Government Training College, who have already passed their second examination for a teachers' certificate, and (2) to young men already in business who have completed to the satisfaction of the authorities a sixyear course at a public Secondary school, and who show the requisite intellectual maturity for the work of the High School of Commerce. The conditions for entrance at Frankfort and Cologne are the same as at Leipzig, except that in the first case women may be admitted provided that they have completed a nine-years

course at a Secondary school for girls or possess a corresponding qualification. These technical conditions of previous training are only enforced in the case of students purposing to qualify for the certificate of studies. Other persons wishing to attend the courses are allowed to do so.

The full course of study at the High schools at Leipzig, Aachen

Course of
Instruction in a
German Commercial
High School.

and Cologne extends over two academic years, and at its conclusion an examination is held, a certificate being awarded to successful students. The Leipzig High School also awards a diploma certifying fitness to teach commercial subjects. The compulsory subjects in the examination for

this diploma are as follows:—(1) Modern Languages—English and French; (2) Higher Commercial Arithmetic; (3) Book-keeping; (4) German Commercial Correspondence and office routine; (5) Economics, Principles of Public Finance and Outlines of Commercial History; (6) Commercial Law, and (7) Outlines of Commercial Geography. The examination includes a viva vace test in all obligatory subjects. There is a written examination in each subject offered by the candidate. Each candidate has also to submit a thesis, prepared during a period of six weeks before the examination, on some subject drawn from Economics, Commercial Law, Commercial History or Commercial Geography. He has also to give a trial lesson on a subject assigned by the examiners, and to undergo a viva vace examination on methods of teaching.

At the Leipzig School more than 300 students are in attendance, at Cologne about 200; at Aachen the numbers are much smaller.

Institutions similar in general character to those described above exist at Antwerp, in Paris and other French cities; in connection with many American Universities; in Neuchâtel, Geneva and other cities in Switzerland; in Vienna, Trieste, Prague and other cities in Austro-Hungary; in Venice; and in Tokyo.

Especially significant, however, have been the recent developments in higher commercial education in

Higher Commercial
Education in
England.

ments in higher commercial education in England. The London School of Economics and Political Science, connected with the University of London, has achieved a position of high intellectual distinction, and

offers a programme of instruction which in range, quality and interest is unsurpassed elsewhere. Equally valuable and important is the work which is being done in the faculties of commerce at the Universities of Manchester and Birmingham, while at the University of Cambridge much has been done in late years to develop courses of training suitable for those intending to enter business life. There is also an important School of Commerce in Liverpool, controlled by a joint committee representative of the Liverpool Chamber of Commerce, of the University of Liverpool, and of the Education Committee of the Liverpool City Council. The special characteristic of the English developments in higher commercial education is their close connection with the universities. In every part of England the lower grades of commercial education are being vigorously attended to. The weak spot in the English system lies in the defective quality of so much of the secondary education at present available for the children of parents narrow means. But there are many signs that grade of education will soon receive the increased attenaid which, in the national interest, tion and it tively requires. It is significant that in the English commercial cities, where higher secondary education in day schools has been most effectively organised-London, Manchester and Birmingham—the work of higher commercial education has been most effectively promoted.

The Victoria University of Manchester confers in its Faculty of Commerce the degrees of Bachelor of Commerce and Master of Commerce. All candidates for the degrees of Bachelor of Commerce are required (1) to have passed the matriculation examination of the University of Manchester, or to have passed the final examination for a degree in some other university in the United Kingdom; (2) to have attended a course of study approved by a university and extending over at least three years; and (3) to have satisfied the examiners in Political Economy, Geography, Modern History, a Modern Language, the Organisation of Industry and Commerce, Accounting, Commercial Law, and one or more Special Subjects. Candidates may present themselves for any one subject or any selection of subjects at once. Qualifying courses for degrees are arranged at such hours as to make it possible for students engaged in business to graduate in the faculty. The degree of Master in Commerce is conferred only upon Bachelors of Commerce of three years' standing from their graduation as Bachelors. Candidates degree are required to offer a for the Masters' dissertasubject approved by the faculty. tion on some University also awards a higher commercial certificate, candidates for which must give evidence, before commencing the course, of attainments of a standard similar to that required by the Joint Matriculation Board of the Universities of Manchester, Liverpool and Leeds. They must attend a course of study, in the Faculty of Commerce, extending over at least two years, and must satisfy the examiners in Political Economy, Geography, Commercial Law and a Modern Language, together with at least two other subjects. The standard of examination for the higher commercial certificate is the same in all subjects as that required for the degree of Bachelor of Commerce.

I now turn to the work of the Rathmines School of Commerce.

The work of the Rathmines

Its programme is wisely comprehensive. gives those who are already in business an opportunity of systematising their knowledge School of Commerce. of economic and commercial problems. provides a sound training in the principles

which underlie all commercial undertakings. It gives specialised instruction in Accountancy, in Banking, in Insurance, and in Railway Management. Its work, which is wisely planned and skilfully executed, owes not a little to the wisdom of the committee in according free scope to the teachers in their work, and to the careful selection of experienced and practical instructors. It has also the further merit of being so designed as to fill a gap in the educational provision of the metropolitan area which it serves. What the City of Dublin Technical School does for technology, the Rathmines School does for commerce. There is good hope that it may steadily advance to a position of national importance. Its work is at present confined to evening students, but, if the demand arises, it might afford opportunities (possibly in concert with the Department of Economics at Trinity College) for the higher kind of commercial education for day-students who are willing to devote a considerable portion of time to a course of scientific study in preparation for their calling.

Thus, a general review of the present position of commercial education in different countries shows the Some General growing importance of this branch Considerations. training. It is felt more and more that in business life, as in other great callings, systematic and competent instruction can usefully supplement what is learnt by individual experience, and that the guidance of science is needed to correct the shortcomings of the "rule of thumb."

But we may heartily approve the advancing popularity of commercial education without slipping into the fallacy that instruction in the class-room can ever form an effective substitute for the sterner training of practical life. That it can never do. Business life as it exists under competitive conditions, under the real strain of practical affairs, can never be artificially reproduced in a school. What the school can do is to supplement practical experience, to illustrate it, or to prepare the mind for it. A substitute for it, it Still less can any process of instruction create can never be. powers of business leadership. It can stimulate the development of those powers; it can furnish their possessors with opportunities of gaining the knowledge useful in business enterprise, but it cannot create them. The rare combination of qualities which distinguish a great man of business-imagination, constructive ability, resourcefulness, the instinctive perception of essential points, the quick sense of opportunity, the power of saying No, moral courage, physical endurance, bedrock trustworthiness-these are qualities of mind and character which may indeed be fostered by the right kind of education, or injured by the wrong kind, but which are gifts of nature, inborn and developed by practical exercise, or under the pressure of necessity.

For my own part, I conceive that commercial education will prosper most when it is in closest relationship with practical busi-The idea that a school can equip a young man, before ness life. he joins a business house, with a panoply of commercial knowledge which will enable him to enter upon a commercial career with the attainments and sagacity of an adept is not entertained by anyone concerned in commercial education. But what is needed is a very close co-operation between the practical men of business and the schools of commerce in training the young men who will in time rise to positions of great responsibility. That the employers should encourage and facilitate attendance at schools of commerce is excellent; but the full benefit of all that is really meant by commercial education cannot be gained unless the firms and their chief subordinates sympathise with the educational point of view, and deliberately set themselves to give opportunities by which some, at any rate, of the rising generation of the employés may learn inside the business the relation between its different parts, and may gain a general view of the business as a whole. I know the objections which are often felt to such a course, and I do not wish to minimise or ignore them. But I venture nevertheless to point out that the

heart of the whole problem lies much less in the provision of commercial schools (though their work is indispensable) than in the disposition of men of business to develop the educational side of the duties entrusted to young subordinates of talent and energy inside the business hours. It is this educational attitude of mind on the part of employers, this gratification in giving opportunities of development to talent inside the business by so adjusting the work as to make its discharge a progressive training in itself, which is most to be desired and most likely to result in the training of a fine succession of highly-competent business men.

Though the knowledge derived through commercial education is of great benefit to energetic individuals in pressing their way to positions of greater responsibility and of higher remuneration, this individualistic side of the movement is not so significant of its real tendency as the fact that commercial schools equipped and staffed by the aid of public funds are in effect collectivising, and making available for a wider circle of efficient workers, knowledge which under other conditions is the possession of the few. One of the most striking features in modern developments is national organisation for international relationships. In this movement commercial education seems destined to hold an important place.

The root idea of modern national organisation is the training of each individual, without distinction of birth or creed (1) for the duties of citizenship, and (2) for discharging with expert skill the duties of his chosen calling. Hence the double need which presses itself upon the thoughts of every enlightened people, first, for improved facilities of general education, and secondly, for well-planned opportunities of technical education. Technical education includes, as one of its departments, commercial education. Were we to develop industrial education without at the same time developing commercial education, we should have an incomplete structure. By commercial education men are trained to develop markets for the products of which the volume is increased by industrial education. But commercial education in its turn is not one problem, but a cluster of problems. It must comprise a general training in the sciences which underlie commercial activities, but it must also be so specialised as to meet the technical needs of different branches of commerce. And it must rest upon the foundation of a sound. general education. For its real efficiency it depends upon the excellence of the Primary and Intermediate schools. And one of

the results of the modern development of commercial and technological instruction is to draw public interest to the practical importance of improving or co-ordinating every grade of education from the bottom upwards.

At first sight national education in its less specialised form may seem to rest upon the principle of collective well-being, and commercial enterprise solely upon individual energy. But in point of fact no such sharp contradiction of principle holds good. commercial success of a modern nation is partly the outcome of national policy and organisation; on the other hand, no nation can be supple and vigorous which does not develop among its citizens a high degree of individual enterprise, and the power of acting intelligently when alone. Nor should commercial education rest upon the idea that the desire of individual profit is the sole intellectual postulate of commercial success. At bottom the business relationships of the world are human relationships. fore, in the training of the commercial classes it is necessary to give a large place to the teaching of the humanities, to the study that is of the ideals and achievements of men and of their relationships to the physical conditions under which their life is led. need those kinds of training which safeguard individuality and uprightness of character, while at the same time training men in the habits of scientific co-operation on modern lines. words, the training which leads up to the special study of commercial problems should have a strong ethical influence. It should appeal to the imagination, to the sympathies, to higher than self-regarding motives. What colours an educational ideal is its hidden ethical postulate, and the meanest of all ideals is what Bacon called "The Sabbathless pursuit of a man's own fortune." The citizen who with all his energy helps to realise national wellbeing through associated enterprise has the most choiceworthy life. and finds in such a life the best fulfilment of his individual powers.

M. E. SADLER.

## "RED WATER" IN CATTLE

(Piroplasmosis or Haemoglobinuria in Bovines.)

One of the most common ailments affecting cattle is that known as red water or red murrain, and there is no doubt but that it causes annually serious loss to the country. An account of the disease as it is at present understood may be of interest. Certain it is that the ideas prevalent amongst most of those outside the veterinary profession as to the cause will require to be altogether abandoned.

Red water has been likened to human malaria, and indeed in some countries has been called bovine malaria, and, as we shall see later, that though there are radical differences between the two diseases, still they are comparable in more features than one.

The disease is widespread. It is present in North and South

Distribution of the Disease.

America, in Africa, in Australia, and in various parts of Asia. In Europe it is well known along the banks of the river Danube in Roumania, and it affects cattle in Russia,

Finland, Central Europe, Sardinia, Germany, Holland, Belgium, and France. I have seen the organism in films of blood sent to me from England, and the disease is very common in Ireland.

It was, and among men not trained in veterinary science is still,

The Cause of the Disease.

ascribed to some irritant taken with the food whilst at pasture. Long rank grass has been blamed, and also the feeding found in marshy, low-lying districts subject to

flood. It is known in Scotland as moor ill or moor evil. In 1888 Babes noticed in the blood corpuscles of animals suffering from Haemoglobinuria, a common enough accident among cattle feeding along the banks of the Danube in Roumania, round bodies shining brightly. He thought they were micrococci, failing to note their true nature. In 1889 Theobald Smith, studying Texas Fever, found a micro-organism in the blood corpuscles, which he described as a haematozoon, a micro-organism which was later called the pirosoma bigeminum. Some time afterwards, however, it was found that the term pirosoma could not be used, as the name had been already given to something else, and so the name piroplasma was coined, and the organism then became known as piroplasma bigeminum. The preliminary work of Smith in 1889 was followed

by the classical monograph of Smith and Kilborne in 1893, a work done under the direction of the Bureau of Animal Industry, U.S.A., and the results published by that department. It may be granted at once that the results of Smith and Kilborne have been confirmed by workers all over the world, and that little has been added to What, however, has been clearly proved is that Texas Fever of the United States is the disease which is known almost universally as "Red Water." After Smith and Kilborne's work came reports from many countries where the disease was common confirming the nature of the cause of disease. piroplasma was found in Finland in 1894 by Krogius and Von Hellens; in 1895 San Felice and Loi discovered it in the blood of animals in Sardinia suffering from haematinuria (Sub 'etiologia della ematinuria dei bovini in Sardegna, Med, Trovitr, No. 16, 1895). In 1897 and 1898 Celli Santori and Tiemann announced the discovery in Italy. In 1899 Jackschath studied the disease in North Germany, and others found the parasite in cattle suffering from haemoglobinuria in other parts of the German Empire. discovery of the parasite followed in Norway, in Russia, Turkey, France, Belgium, Portugal, England, and Ireland (1901). It will be seen that the disease is spread over Europe, and that investigators are unanimous in their identification of the parasite. is no need to record the work that has been done in South America, in Africa and Australia, important though it is, save than to say that in these continents the cause of red water is recognised, and the piroplasma is identified with the disease.

The piroplasma bigeminum is an intracorpusoular parasite, though occasionally parasites free in the blood plasma may be found. The Parasite. The parasite is pear-shaped, or like a willow leaf-it may be circular or a mere dot. Frequently two parasites are united; their resemblance to two pears joined by a common stalk is striking, or the two parasites may lie in opposite directions. Sometimes they form nearly a straight line, being joined by their attenuated extremities. They may be found in the corpuscle or on it. We have already mentioned that they may be free. blood corpuscles be examined in the wet film, protected from evaporation, upon a warm stage, or even at the ordinary temperature in summer, the parasites may be observed to move in the corpuscle in which they are. The parasites possess ameeboid movement. I append herewith a sketch of the wanderings of a parasite in a blood corpuscle observed for half an hour. (Pl. I. page 260).

The parasites are easily demonstrated in the film made from fresh blood rapidly dried in the air and then fixed. The film may be stained in any one of the numerous methods recommended, and the details of the parasite made out. Personally we prefer the original Romanowsky method, or that of Giemsa. stains as a blue pear-shaped, leaflike, circular or dot like body, with at one point a more or less bright red dot. This is the karyosome. The various shapes assumed by the parasite may be considered as indicative of stages in the intracorpuscular life history of the parasite. In the capillaries of organs they may frequently be found circular; in the peripheral blood, however, which is most often examined, the shapes above mentioned are to be met with. The parasite is from  $2\frac{1}{2}$  to  $3\frac{1}{2}\mu$ . in length, and from '8 to  $1\cdot 2\mu$ . in thickness. The spherical or circular bodies are from 1 to  $2\mu$ . in diameter  $(1\mu) = \frac{1}{25000}$  inch. The parasite is larger than that observed in Rhodesian Red Water or East Coast Fever. site is frequently shaped like a rod or bacillus, and has been named the Piroplasma parvum to distinguish it from the larger one causing ordinary red water.

The parasites multiply by direct division, first, the karyosome clongates and then divides, and the body of the parasite divides in its turn. Sometimes four parasites may be observed in a single corpuscle. There may be three, very occasionally five.

The culture of these parasites in media used in the laboratory for ordinary bacterioscopic investigations has failed. Lignières, working in the Argentine, by using a special medium, claims to have cultivated the organisms through five generations. The third generation was richest in parasites, which were all of the circular or spherical form. The writer, using a medium, recommended for the culture of trypanosomes (also animal parasites), believes that he obtained a proliferation of the parasites. They also were circular forms.

Adult cattle are more frequently the victims than young stock,

though yearling bullocks and heifers at grass

Symptoms of the
Disease. are not free from attack. The period of incubation can only be judged from experiment, and probably is about ten days, i.e.,

ten days usually elapse from the time of infection to the appearance of symptoms. The first signs noticed are those of general ill-health; the animal isolates itself, ceases to feed, and to ruminate. The respirations are hurried, the pulse is rapid, the temperature is high, maybe 104°, 105° or 106°. There may be constipation

or on the other hand profuse diarrhea. If the animal is in milk, the quantity produced falls off, and often the milk is red tinted owing to the blood colouring matter staining the milk plasma. Condition is lost and often rapidly. The most important symptom, however, is the colour of the urine. This may be merely high-coloured, of a red wine tint, dark brown, or dark red to the colour of porter. The quantity voided does not as a rule come up to the nominal amount, but the patient frequently passes a small quantity of high-coloured fluid. The urine also contains a large quantity of albumen, which may be detected by the usual tests. There are undoubted cases where there is no discolouration of the urine.

If the case is a severe one weakness sometimes becomes extreme. the appetite is in complete abeyance, and rumination has entirely ceased. There is a grunt, the respirations are hurried, and the pulse quick and often irregular. Coma or delirium sets in and the patient dies. If the case is not so severe, then after a time the temperature falls, appetite gradually returns, rumination is resumed, the urine clears up and takes on the normal tint. Loss of condition is apparent, and may be so for some time, the animal recovering only slowly the condition it has lost. The changes to be observed in the blood are very characteristic and striking. During the earlier stages of the disease there is a rapid fall in the number of coloured blood corpuscles. The normal count per cubic millimetre is between seven and eight millions of coloured corpuscles, but the destruction may be so profound that the numbers fall to 4,000,000, to 2,000,000, and even below 1,000,000 corpuscles. It is this destruction of the red blood corpuscles and liberation of the colouring matter that explains the colour of the urine. The colouring matter is excreted with the urine.

The change may be readily seen in a drop of blood taken from the ear of an animal when suffering from the disease. It is thin and watery and laked. If a quantity of blood be withdrawn and allowed to coagulate a clot forms, but the blood serum expressed by the contraction of the clot, instead of being a pale straw colour, is tinted red, showing the presence of free haemoglobin. The blood in a case that has recovered often shows an irregularity in the size of some of the corpuscles. Some are very large and contain a certain number of minute bodies which stain by the basic dye used; others are smaller than normal; no pigment is found in any of the corpuscles as is the case in human malaria. Accumulations of pigment may be seen in the haemolymph glands.

There is, according to the length of time the case has existed, a

Post-mortem
Appearances of
Cattle.

certain amount of emaciation. The carcase will not set well, and will appear "fevered." The fat is yellow and small extravasations of blood may be found. The muscles may be pale and have a washed out appearance.

Petechiae or extravasations may be observed on the pleural and serous surfaces generally, with subendocardial haemorrhages. The blood in the heart may or not be coagulated. It may have a tarry appearance, or it may have clotted and clotted firmly. The spleen is in nearly every case enlarged even to several times the normal. Its contents are soft and pulpy. Sometimes there is little change The liver may be enlarged and to be noticed in the spleen. filled with blood, and dark blue black in colour, or it may be paler than normal and yellowish. The bile in the gall bladder is abundant, thick, and tenacious, and the gall bladder may be The kidneys are sometimes haemorrhagic, greatly distended. especially in the cortex, and on section often show wedge-shaped black streakings. In cases of some duration the kidneys may be pale, soft and anaemic. The mucous membrane lining the urinary bladder is congested, and the bladder contains urine of the same nature as that passed during life. The contents of the intestine The lungs are generally without lesion may be blood-stained. specific of piroplasmosis. They may be emphysematous or oedematous. The post-mortem appearances in some of its details suggests anthrax, but below I give a table from Lignières showing at a glance the differences:-

### PIROPLASMOSIS.

Spleen .- Enormous, dark, firm.

Liver.—Often yellowish, with thickened bile in abundance.

Urine.-Haemoglobinuria.

Lymphatic Glands.—Rarely swollen, rarely haemorrhagic.

Muscles.-Normal, healthy in appearance.

Blood.—Fluid coagulating well, become arterialised on exposure, then darkening.

### ANTHRAX.

Spleen.—Very large, pulpy, soft, semi-fluid.

Liver .- Always bluish, with liquid bile.

Urine.—Never haemoglobinuria, sometimes contains blood (haematuria).

Lymphatic Glands.—Much enlarged, often black and haemorrhagic, very cedematous.

Muscles.—Fevered, grayish, with peculiar odour.

Blood.—Thick, tarry, coagulating and changing colour badly on exposure to air

This comparison may be used for diagnostic differentiation, but every case will have some peculiarity of its own, and each must

be judged on its merits. A microscopic examination will in every case make the diagnosis positive, and in some cases, where the attack has been very acute, diagnosis is alone possible by the aid of the microscope. I have one case in my mind. A spleen was sent to the laboratory believed to be from a beast dead of anthrax. An examination made for the anthrax bacilli failed to detect their presence, but a control slide stained for the piroplasma showed them in great numbers. In this case no history could be obtained of red water, anthrax was unsuspected, and it was not until the post-mortem examination had proceeded some way that the possibility of anthrax forced itself upon the observer. For practical purposes therefore the colour of the urine is of paramount importance.

We have seen that the disease is due to the presence in the coloured corpuscles of a parasite—the How Cattle become piroplasma bigeminum—and naturally the question arises, how do the parasites gain access to the corpuscles? The parasite is inoculated by the bite of the common tick, Ixodes reduvius.

The tick is a blood-sucker, and when adult, after fertilisation, being gorged with blood, falls to the ground. The large ticks so well known, the size almost of a horse bean, are females filled with blood and eggs. The male ticks are much smaller, and may occasionally be found on the ventral aspect of the female in copulâ. The fertilised engorged female tick after a short time proceeds to lay her eggs. She produces from 1,500 to 2,000 eggs, and these after a variable time depending upon the time of the year, temperature, weather, etc., hatch out a small, active six-legged larvæ or "seed" ticks. The time required for the hatching out is from three weeks to a month. The seed ticks climb blades of grass, or lowgrowing shrubs or herbs, and wait for a host to come along. fasten when opportunity occurs upon the host, and after feeding, and in about ten days' time they cast their skin and acquire another pair of legs. They now have four pairs of legs, are nymphs, and as yet not sexually mature. The nymphs can bite and suck blood. After the lapse of a few days, about a week, the nymph casts its skin, becomes sexually mature, and a young tick. young tick loses no time if opportunity serves in attaching itself to a host for feeding purposes. It also breeds and gives rise to a

new progeny. Now, if the tick feeds and gorges itself upon an animal carrying the parasites of red water in its blood, along with the blood it extracts, a number of parasites is taken and pass into the body of the tick. What their fate is here no one knows, though many have examined the contents of the alimentary tract of the tick and sections of its tissues. We do know, however, that young ticks hatching from the eggs laid by the mother tick that has fed upon infected blood are themselves infected, and are capable of setting up the disease in healthy cattle upon which they feed. This is one of the very few examples known to science of an infectious disease being transmitted from mother to offspring. There is little doubt that the tick becomes infected when it takes in infective blood from the beast upon which it is feeding. Young ticks hatched out from eggs laid in the laboratory by mother ticks, taken from off animals suffering from red water, have, when placed upon healthy cattle, given the disease to them. For red water therefore to be perpetuated, cattle and ticks are necessary, and so far as we know no other animal can take the place of either of them. Further, and this is a remarkable fact, it is not possible by any means at our disposal to give the disease to any other animal but the bovine. Horses, sheep, swine, dogs, rabbits, guinea pigs and fowls are all immune to injections of blood from diseased bovines, though in suitable subjects, and under suitable conditions, there is little difficulty in reproducing the disease in bovines by such injections. Horses, sheep and dogs suffer from piroplasmosis, but it is a piroplasmosis peculiar to each species, as bovine piroplasmosis is peculiar to cattle. It is not possible to produce piroplasmosis or red water in cattle by injecting them with blood from a horse suffering from equine piroplasmosis. The converse is also true. A peculiarity of the piroplasma is that it is pathogenic only for one species of mammal, and that it requires two animals—a mammal and a tick-for its complete life cycle, just as is the case for human malaria. If there were no mosquitos there would be no malaria; if there were no ticks there would be no red water. The life history of the piroplasma may not inaptly be compared to that of a tapeworm. In the latter animal a second host is necessary, in which it may pass the bladder worm stage of its existence, and the completion of the cycle is only rendered possible if the bladder worm is consumed by the host, which is capable of harbouring the tapeworm stage. In the case of the piroplasma, however, we do not know in what condition it passes its life cycle in the tick.

At the present time we do not know of any certain remedy for red
water, and it must be admitted, unfortunately, that in most cases the assistance of
the veterinary surgeon is not sought for until

it is too late, and the patient is not given any chance from what may be termed expectant treatment. That many animals recover and that more would recover if put under scientific treatment is beyond doubt, and until a remedy is found that will in the vast majority of cases bring about the longed for result, owners must be satisfied with the means at present available. It will be more profitable if we discuss here the methods that have been tried with the object of producing an immunity to the infection, though we must not lose sight of the fact that the eradication of the tick would bring about the degired end. We will treat of this latter fact further on.

It is common knowledge that animals born and reared upon a farm where red water is prevalent rarely, if ever, suffer severely from the disease. It is equally well known that animals purchased and brought on to the farm take the disease often in an acute form and die. What is the explanation of this? Lignières mentions that in the Argentine Republic the province of Santa Fè is badly infected with the disease. A certain gentleman purchased a large number of cows and sent them to the province to be fed there. Red water made its appearance, and the mortality was so great that sixty and more died daily. The cows alone suffered; their calves did not die, though it is plain that they must have harboured ticks as did their dams. The fact is that calves possess a natural immunity to the disease—an immunity which gradually declines as the animal grows older, but which, whilst it lasts, will protect a calf against a dose of virulent blood that will dam (see note at Calves end). reared upon where the disease is prevalent possess this immunity, and though this immunity is fleeting, still by the infections to which they are subject from the bites of ticks it is rendered active and more or less durable. It is now known that an attack of a certain disease will give the person or animal infeeted on recovery an immunity to that disease which may last a lifetime. So also by experiment it has been shown that immunity to certain diseases may be given to men and animals by inoculation of sera, attenuated virus, &c., such, for instance, as in ordinary vaccination against smallpox, injections made of serum to protect against tetanus, the vaccine employed against anthrax, blackleg, &c. In ordinary vaccinations, as against anthrax or

blackleg, the vaccine is believed to produce a mild form of the disease insufficient to kill the animal, but sufficient to create immunity. Now in a calf upon a farm where red water is prevalent the natural immunity is sufficient to protect the calf from so serious an infection as to cause death, but the immunity is not absolute, the calf does become infected, but the infection is so mild that it passes unperceived. It is sufficient, however, to protect the calf and to strengthen the immunity, and a succession of such immunizations is sufficient to give the calf a more or less lasting immunity. This for the animal reared upon the farm, but what is the fate of the newly-purchased, coming from a district where the disease is unknown? The natural immunity has been lost as the animal grew older, and now without immunity, natural or acquired, it is subjected to infection to which it can offer no resistance, and to which probably it will succumb. On the other hand an animal from an infected farm, with the parasites in its blood, and they may be found in the blood for months after recovery from infection, may be the means of spreading the disease and of causing an outbreak of red water in a district where it was heretofore unknown. Here the tick is the prime agent in disseminating the disease. Taking in blood which contains the parasite, possibly in such a condition that if large quantities of the blood were injected directly into a susceptible animal it would only produce a trifling infection and favour the creation of immunity, it assists in the completion of the life cycle of the parasite and produces a progeny of infected ticks ready to inoculate the disease into bovines upon which they feed. And under such circumstances practically all the cattle upon a farm hitherto free from red water may suffer from the disease, accompanied by a very high mortality.

In practice immunization may be attempted along the lines indicated in nature by giving a slight injection from which the animal recovers rapidly, having obtained at the same time some degree of immunity. This immunity may still further be strengthened by giving a stronger dose of virulent blood. The immunity thus brought about, the disease artificially produced in a mild form, may be quite sufficient to protect the animal against natural infection. Some work upon these lines has already been done, and the results are said to be encouraging. We will mention here the lines adopted as far as our information goes. Immunity has been sought by the use of blood obtained from animals that have recovered from the disease, or obtained from animals living in a district where red water is prevalent. In the

latter case the animals have obtained immunity in the manner described above. A serious drawback to this method is the nature of the material used for inoculations. There is no means of controlling the virulence of the blood, and it may be so potent as to cause death from acute red water in susceptible animals. Calves from eight to ten months old are chosen, and these receive under the skin from 1 to 5 c.c. of blood, defibrinated or not. Eight days after, the inoculated have an elevation of temperature which lasts for about a week, and there is observed a fall in the blood count. In three weeks the inoculated are in their usual good health, but a second rise in temperature is noticed at about the fourth week, and also a fall in the number of corpuscles. method of producing an artificial immunity has been used in the United States, and also in Australia (where red water receives the name of tick fever). In Queensland 35,000 head of stock were inoculated and afterwards 17,960 of these were exposed to infection by ticks; 678 died, or 3.6 per cent. According to the Queensland operations the amount of blood to be used is not definite; doses from \(\frac{1}{2}\) c.c. to 300 c.c. have caused death, whilst on the other hand doses varying up to 800 c.c. have produced no harm. From this one must infer that the method is risky, and some other more certain way of producing immunity must be found.

Lignières has prepared a vaccine, but there is no information at present as to how it is prepared. It is probably polyvalent, that is, prepared from several organisms, as Lignières believes that there are more than one piroplasma infecting the ox.

At the Louisiana Experimental Station, according to Dalrymple, experiments were made with material obtained from the engorged ticks. The results are given as follows:—

- "1. The blood with which the adult ticks are filled, after maturing on southern cattle carries with it the power to produce Texas "Fever when injected under the skin of a susceptible animal.
- "2. Experiments indicate that we may be able to take ticks from recently-immunized animals, ship them considerable distances, and utilize them as a substitute for the blood drawn from the vein, where recently-immunized animals are not available.
- "3. Experiments further indicate that this will give a milder "form of disease, and afterwards immunity, just as effectual as "when the blood is taken from an immune animal immediately "before being used.

"4. We have not, as yet, found any way of preserving for any "considerable time the blood drawn from the vein without it "losing its power to produce immunity."

The use of the contents of engorged ticks has several disadvantages, one of which is that the contents of the alimentary tube of the tick may contain something more than blood and piroplasmata. The ticks are disinfected with an antiseptic fluid, then washed in boiled water, bruised in a mortar and a little water added. The fluid alone is used for injection. Three ticks suffice for an ox.

Though, as we have remarked previously, blood inoculation is unsatisfactory, because there is no way of arriving at a correct estimate as to the dose, in Louisiana injection of blood is employed to produce immunity. It is said (Dalrymple) adoption of blood inoculation that prior to the 40 to 90 per cent. of cattle from the Northern States, introduced to the Southern States of the Union, died from Texas Fever. January 1, 1904, 4,562 animals had received blood inoculations, and the mortality amongst these from Texas Fever has averaged 7.7 per cent. The blood used is obtained in the usual way from an animal immune to Texas Fever, and a dose of 1 c.c. (about seventeen drops) is inoculated into each animal to be immunized. reaction is observed, as mentioned previously, at the eighth day, when the temperature is very high. The temperature declines, but at about the fourth week a recrudescence of fever is observed. After the fever has passed off a second inoculation is made with 2 c.c. of blood with the object of increasing the immunity. After the second injection the patient is kept under observation "to watch the course of the fever, should there be any."

Inoculations were made in late autumn or early winter in order that there should not be a great infestation with ticks. In other words time must be allowed for the immunity to develop. To inoculate the animals with blood and to expose them at once to infection would be to court disaster, because the ticks would set up the disease by their own inoculation. If we could regulate the number of ticks to prey upon each animal we should facilitate the creation of immunity, and in precisely the same way, or at least on similar lines as it is produced naturally in young stock. The object of choosing late autumn or early winter is to limit as far as possible the tick invasion. Though the mortality has fallen the

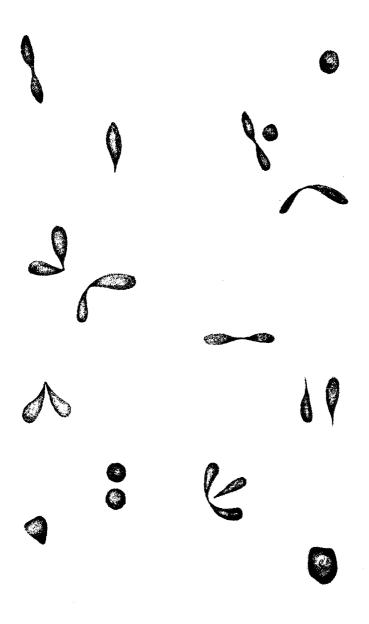
experimenters admit that complete immunity is not given by artificial inoculation, but an immunity only sufficient to enable the animals to withstand the attacks of ticks if the latter are in moderate numbers. It seems then that inoculation by blood from immune animals will give a degree of immunity comparable in some respects to that enjoyed by the calf, and that a thorough immunity is to be hoped for from the attention of ticks to the partially immunized ox. It might be possible by hyperimmunizing an animal to obtain a blood which would give better results than those from blood of an animal possessing ordinary immunity. Experiments upon these lines might be instituted. It may be well here to note my own experience with the use of blood from acute cases of red water for inoculation purposes. During last summer I saw many cases of red water upon a farm, and from one of the animals I abstracted 200 c.c. of blood. The blood was received in sterilised flasks, defibrinated with a sterilised wire brush and preserved in sterilised tubes. The operation was performed late at night, and early next morning I left for college. A six hours' journey brought me to the laboratory at 11.30 a.m., and I at once made inoculations into a goat, a bull two-and-a-half years' old, and a bullock eighteen months' old. In none of these animals was there any reaction. I did not expect any reaction in the goat, because goats possess a natural immunity to bovine piroplasmosis. I did expect a reaction in the bull, because it has never had a tick upon it, and its natural immunity must long since have disappeared. I also anticipated a reaction in the bullock. The blood used for the inoculations contained numerous parasites, at least 70% of the corpuscles were infected. I believe my non-success at setting up the disease is also the experience of others.

To guard against loss from red water two lines of action suggest themselves—immunize the cattle, or get rid of the ticks. As to the latter the task would not be difficult if the land harbouring them could be rested from stock for a year or so. In South Africa it has been shown that badly-infected farms can be rendered quite safe if cattle are kept off for a period of fourteen months. This period of time is sufficient for all infected ticks to die off, and there is no reason to believe that the disease will reappear unless a sick animal or one carrying parasites in its blood comes on to the farm to again infect the ticks. Ticks will not be exterminated so long as there are animals present upon which they can feed, but as the bovine is necessary for the

perpetuation of the piroplasma bigeminum along with the tick, the absence of one host will bring the race of the parasite to an end. If it were possible to remove cattle from the farm and put on horses or sheep, after a time, the farm would become free of red water, as the ticks carrying the infection would all be dead. Cattle pastured upon a farm where red water is known to exist should be bred upon the place, or, if purchased in the market, should be carefully immunized before being turned out to graze in its meadows. periments might very properly be instituted to determine the value of blood injection as an immunizing agent, and especially to test the value of the blood of animals reared upon the place as the agent for producing immunity in the newly-purchased. If injections of blood were found to be really valuable, and there is some evidence in favour of the method, then every owner of stock would have the material at hand for protecting his new purchases, and it could be utilised by his veterinary surgeon whenever new stock was acquired.

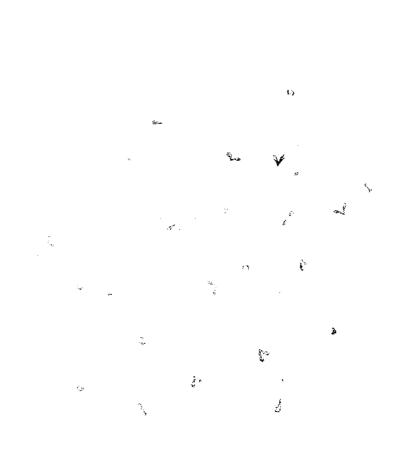
#### A. E. METTAM.

Note.—Since the above was written, and during the present month of December, I have had the opportunity of making a postmortem examination of a cow dead from red water. The piroplasmata were very abundant not only in the corpuscles, but free in the blood plasma. The cow was in calf, and in the uterus I found a five months' foetus. With all precautions I obtained the blood from the umbilical vein and prepared films for microscopic examination. These when stained and examined showed in certain corpuscles the presence of the dot form of the piroplasma indistinguishable from the same form in the I have no blood. hesitation therefore in affirming that the organism of red water is capable of passing through the placenta and infecting the foetus. In this manner the foetus may obtain the passive immunity observed in the young calf. leagues. Professors Wooldridge and Craig, confirm the presence of the piroplasmata in the foetal blood after examination of the films.—21/12/05.—A. E. M.



A.E.M.

Various phases of the parasite Piroplasma Bigeminum, as observed in a blood film. The corpuscles are drawn to one size and the organism increased proportionately.

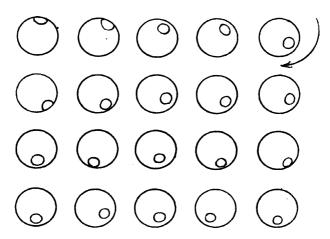


A drawing made from a film of blood obtained from a case of Red Water in a cow. The parasites are to be seen in the corpuscles; a bigeminute form is free.

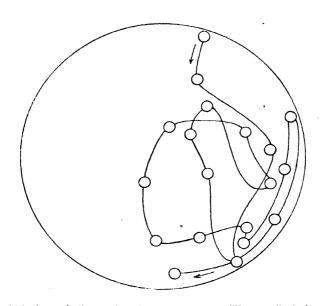
(Drawn by Mr. A. C. Duncan, M.R.C V.S., late Assistant in the Royal Veterinary College, Dublin, now of the Royal Agricultural College, Circnecester.)



PL. III.



The position of the parasite in the red blood corpuscle observed moving for a period of half-an-hour. The corpuscles were drawn and the parasite indicated during the observation.



The circle is to indicate the blood corpuscle. The small circles show the position occupied by the parasite during its excursion through the corpuscle. The line shows the tract of the parasite during the half-hour observation.

#### "STORES" VERSUS "BEEF."

No more than a hundred and fifty years ago the only part of the United Kingdom that devoted itself to

the Fat Cattle Industry.

The Early History of the fattening of cattle was Norfolk. farmers of that county had not only discovered a valuable winter food in the turnip, which had been introduced to England a

hundred years before, but had also learned how to grow and use it with success. Situated in one of the most populous parts of England-Norwich was then the second city in the Kingdom-and within a reasonable distance of London, they took the lead at once, in preparing fat stock for the local and London markets. With the increase of population and with the advantage of knowledge and means of communication, the Norfolk system of farming spread Within fifty years it was general in gradually northwards. Northumberland and the Lothians; a few years later it reached as far north as Aberdeen and Moray; by the middle of the nineteenth century the whole east coast, from Norfolk to the northern shores of the Moray Firth, was eagerly engaged in growing turnips and preparing fat stock for the Scotch and English markets. other districts were similarly engaged, but the East Coast was the great fattening region.

In the days when Norfolk alone was occupied in the industry, the stores to be fattened were drawn mainly from Scotland and the North of England, but, as the fattening area expanded northwards. and the south-going cattle were intercepted nearer and nearer the districts in which they had been reared, the southern farmers. finding it increasingly difficult to obtain northern store cattle, had to look elsewhere for their supplies. First they looked to the West of England, then to Wales, lastly, when the full output of these districts had been reached, to Ireland. Since that time the number of cattle going annually from Ireland to England and Scotland has grown larger and larger, until in 1902 it reached a total of about 1,000,000 head, equal to two for every three cows in the island.

The fact that Ireland has been gradually increasing her production of store cattle while the East of England and Scotland has just as persistently Should Ireland produce Stores? stuck to the production of fat cattle makes it desirable to consider whether the present

system is as profitable to Ireland as it is believed to be, and, if not, whether it might be amended. Such an inquiry is all the more desirable now that, in sympathy with the increasing demand and the higher prices for younger beef, many more British farmers are falling into the practice not only of fattening but also of breeding and raising the young stock required to meet this demand: a practice which in time will tell against the trade in Irish store cattle.

As the problem is almost entirely a problem of money, we must consider the returns obtained by Irish farmers for breeding and rearing the cattle sent to Great Britain to be fattened. If these returns are satisfactory no more need be said; if not, then we must endeavour to discover the reason, and, if possible, suggest a remedy.

Let us take a typical case. The majority of Irish calves are born in spring or early summer. After a few weeks upon whole milk they are put upon a The usual Method of ration of separated or skimmed milk, together producing Stores in with a more or less appropriate calf meal or Ireland. cream substitute. They have a share of some convenient pasture during the summer. As the season declines, the cim milk is gradually withdrawn, as is also, unfortunately, the if meal, although, in some cases, it is replaced by a cheaper cor intrated food, which is continued throughout the winter.

During their first winter, Irish calves are fed with meadow hay or a few turnips, where these are grown, and with what can be picked up from the fields that have been pastured or meadowed in summer. They are brought in at night to the homestead or some other building for shelter; and occasionally, but seldom regularly, they are given a small quantity of grain or cake. Next summer, when yearlings, they are run upon the rougher or poorer pastures—the better pastures being retained for cows which are rendering an apparently greater and more immediate return from milk. winter following, when rising two years old, their treatment is similar to the previous winter: shelter and cake occasionally, but usually merely hay or straw, pasture or meadow, and a few turnips. At two years old-the spring of their third summer-they are moved from the rearing districts to the great grazing tracts in the centre and East of Ireland, from which they are again moved to Britain in the following autumn, or, if not then, in the next summer again. If we estimate the cost of producing these cattle, and then set in parallel columns their costs up to certain ages and their values at the same ages, we shall see, at a glance, how the account stands.

# ESTIMATED COST OF REARING AN IRISH STORE BULLOCK.

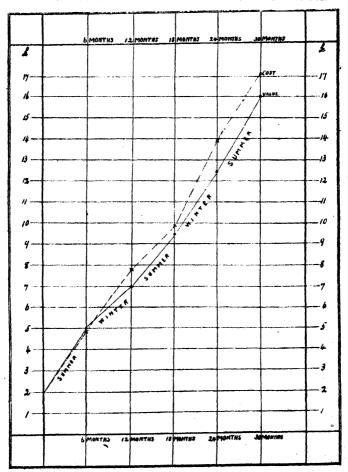
					Cost a Differe Ages	nt	Value the Same A	
From Birth till 6	Months' old : S	ummer.	£ s.	đ,	£ s.	đ.	£ s.	. d.
Price of Calf at birth	1		2 0	0			l	
Whole milk, a gallo a day for two w	on to a gallon	and a half	0.8	o				
Skim milk, 1) gallons			1 -	-				
Calf meal, albs. a to 10s. a cwt.,			0 10	6				
Pasture,			0 7	- 1				
Attendance,		•••	0 10					
Insurance against il			0 4	0			1	
Interest on capital,		,	0 1				1	
I					4		۱	
	At 6 Months,				4 19	· ·	5 0	
From 6 Months to One Year old: Wirter.								
Hay or straw, ¿ ston	e a day for 6 n	nonths,	1 5	0				
Turnips say, one sto	one a day for s	ix mon <b>th</b> s,	0 10				1	
Pasture and shelte	r,		0 5	0				
Attendance,			r 0 10	0			ļ	
Insurance,			0 5	0				
Interest,			0 2	6				
	At One Year,				7	6	7 0	0
From 12 to 18 Months : Summer.							-	
Pasture,			1 10	0				
Attendance		•••	0 5	-				
Insurance	•••		0 2					
Interest,	•••	•••	0 3	6				
	At 18 Months				9 17	6	9 10	0 (
	110 10 11011111	,			·			
From 18 to 24 Months' old : Winter.					,		_	
Hay or straw, ½ to ‡ stone a day for 6 months,			1	-				
Turnips, 2 to 3 stone	•	onths	1 2					
Pasture and shelter	В,		0 10	-				
Attendance,			0 10	- 1				
Insurance,		•••	0 4	- 1				
Interest,		•••	0 4	6		_		
	At 2 Years,	••• •••			13 18	6	12 10	0
From 24 to 30 1	Months' old : Su	ımmer.						
Pasture,		,	2 10	0				
Attendance,	•••		0 5	0				
Insurance,		•••	0 2	6				
Interest,		•••	0 4	6				
	At Two and a				17 0	6+	16 0	0
At I would a list! I ours,					2. 0	٧,	10 0	

The figures in this column are for the better rather than for the poorer classes of Irish cattle.

<sup>†</sup> In this estimate nothing is placed to the credit of manure made by the cattle, for the reason that the manure is not saved and is consequently aimost worthless.

That is to say, if Irish farmers as a whole make any profit on the raising of store cattle these figures do not show it. They show rather the reverse, and this too, on even the better classes of stores. But they show still further that the loss is unequally borne. They show that it falls entirely upon the man who owns cattle in winter. The summer owner makes a profit. This statement will be made clearer by a glance at the accompanying diagram. The broken line shows the cost of rearing a store bullock, the continuous line his value. It will be noticed that in winter the broken line is rising in advance of the continuous line, while in summer it is the reverse.

I.—DIAGRAM SHOWING THE COST OF REARING, AND THE VALUE OF AN IRISH STORE BULLOCK.



The problem now before us is:—How shall the present loss be turned into a profit? It might be suggested that since the wintering of cattle in Ireland is generally unprofitable, it should be abandoned altogether. That is, however, an impossible suggestion, for there would then be no cattle for summer grazing. The country would be in the position of the woodman who sat upon the branch he was sawing.

It has been suggested that Ireland should fatten her own cattle instead of sending them to England and Scotland. No doubt this would be a great improvement upon the present arrangement, for Irish farmers would then earn the profits of fattening as well as the profits of tillage—that is the profits on the production of roots, straw, and corn and hay. But it is sometimes asserted that fattening cattle leave no profits behind them, at any rate, no profits directly. By converting turnips and straw into manure again they may make tillage profitable, but beef, the bye-product of the process, is more likely to entail a loss. The argument is that, if it cost 9d. a day, with the value of the manure being considered, to keep a bullock making 2 lbs. a day, it costs 41d. to produce a pound of bullock. Then if bullocks are selling at  $3\frac{3}{4}d$ , a pound the farmer loses  $\frac{3}{4}d$ , on every pound he produces. So he does; but he gains upon every pound of the original "store." Take a case. store bullock weighing 10 cwts. is brought in at £15 10s., viz., 31s. the hundredweight. He is fed for sixteen weeks at a cost of 9d. a day; he gains 2 lbs. live weight and day, he is sold fat at 35s. the hundredweight, or  $3\frac{3}{4}d$ . the pound. every pound produced three-farthings have, been lost: that is 14s. in all (224 lbs.  $\times$  3d.). But the ten hundredweights brought in at 31s. are now sold at 35s. On them a profit of £2 is made, which turns the loss of 14s. into a grain of 26s. course, if beef be selling at less than it costs to produce, the farmer who produces fat can make no profit unless he buys in his stores at a price sufficiently low to compensate him for the loss on the beef he produces. This, however, he can usually do mainly at the expense of previous owners of the cattle he buys.

But although Ireland would gain by fattening in Ireland the cattle now fattened in England and Scotland, the greater part of the loss at present arising from the rearing and keeping of store cattle would still remain. The great loss would be palliated but

not prevented. If the loss is to be altogether prevented, we must begin when it begins: we must begin by reforming the way in which our cattle—our young cattle more especially—are wintered.

There are several arguments that might be employed to show that better winter treatment of our cattle Better Methods of "Store" Production. effect of cold and discomfort upon animals even well fed; we might refer to the effect of good solid succulent food upon animals denied even housing or shelter; we might point to the way in which Irish cattle thrive in summer only to deteriorate in winter. We might even suggest that a bullock fattened off at two years, besides being more valuable per hundredweight, would not only return his money quicker than one fattened off at three, but would do so at a smaller consumption of food; but the best argument is the argument of experience.

Twenty or thirty years ago the position of farmers in some parts of the North of Scotland was in many respects similar to that of farmers in many parts of Ireland now. There was this difference, however: they had no creameries, and the milk of their cows had of necessity to be devoted to the rearing of calves. In the autumn these calves were in good condition, and the farmers found that if they were well fed, and cared for during the winter, they made great progress during next summer and were all the more easily and cheaply fattened the following winter. In time this practice created the demand for younger beef.

The general management of the North of Scotland cattle is as follows: They are born rather earlier than Cattle Production in the Irish calves, preferably in January or Scotland.

February. The advantage from this is that by the time the cow's milk begins to decline in quantity the pasture is ready for both the cow and the calf. Usually two calves are put to one cow—her own and another. A heifer rears only one calf. The cow suckles the calves till September or even later. In the case of hand-fed calves, about a gallon and a half to a gallon of whole milk and a pound to a pound and a half of good linseed cake is given daily. Calves fed upon skim milk are usually given whole linseed, linseed and oatmeal, or some similar concentrate. Early in September the calves are taken into the house and gradually weaned. They are housed either in a covered

yard or tied up for the winter. At first they are fed with such succulent foods as vetches or cabbage. To these, larger and larger quantities of sliced turnips and a mixture of hay and oat-straw—in many cases oat-straw entirely—are added, so that, by the time the vetches or cabbage are done, the calf is fed entirely upon turnips, with a mixture of hay and oat-straw and a pound or two of crushed oats and linseed cake. In the beginning of winter the ration is about 1 cwt. of turnips, 7 or 8 lbs of hay and oat-straw, and 2 lbs of grain and cake; by the end of winter the turnips are increased to half a hundredweight or more. In the beginning of May the cattle -now yearlings-are put upon pasture. Any that are intended to be fattened off the pasture are given a pound or two of decorticated cotton cake almost from the beginning. Others that are intended to be fattened in the autumn are given some cake from about the middle of August. In the beginning of September these are taken to the byres and tied up. At first they get vetches, but turnips are gradually added. Their ration is finally about 3 cwt. of turnips, 8 to 10 lbs. of oat-straw, with sometimes a little hay, and about 2 lbs. of decorticated cotton cake and 2 lbs. of bruised oats. cattle are usually all away to the butcher before Christmas.

The following figures will show the cost of rearing such an animal and its value at different seasons:—

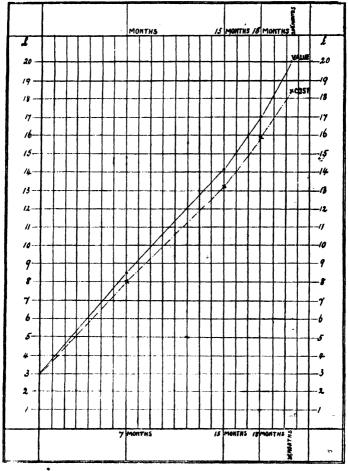
# \* COST OF REARING A BULLOCK TO BE FATTENED OFF UNDER TWO YEARS OLD.

	Cost at Different Ages.	Value at the Same Ages.
From Birth in February till early in September. £ s. d.	£ s. d.	£ s. d.
Cost of Calf, 3 0 0		
Half a cow's milk for the season, 4 0 0	ļ	1
Pasture, 0 10 0		
Attendance, 0 5 0		
Interest on capital, 0 2 6		
Insurance against death or disease, 0 2 6		
- At 7 months,	8 0 0	8 10 0
From September till May.		
Vetches and cabbages, 3 weeks, 0 2 0		1
Oat-straw, 8 lbs. a day for 26 weeks, 1 6 8		}
Hay, 2 lbs. a day for 26 weeks, 0 10 0	1	1
Turnips, nearly 4 cwt. a day for 26 weeks, 2 5 0		
Linseed cake, 1 lb. a day for 30 weeks, 0 14 0		
Crushed oats, 11b, a day for 30 weeks, 0 8 9	1	
Attendance, 0 15 0		
Interest, 0 6 0		
Insurance, 0 4 0		1
14 11 5		,
. Less value of manure, 1 4 0	-	
At 15 months, —	13 7 5	14 0 0
From May till August.		
Pasture, 200		
Attendance, 0 5 0		1
Interest, 0 4 0	1	
Insurance, 0 2 0		
At 18 months,	15 18 5	17 0 0
From August till sold, say 10 weeks.		
Character 10 - 1		
Hay, 2 lbs. a day for 10 weeks, 0 12 6		
Turnips, 8 lbs. a day for 10 weeks, 1 6 0		1
Decorticated cotton cake, 2 lbs. a day for 10 weeks 0 9 6		
Crushed oats, 2 lbs. a day for 10 weeks, 0 6 3	,	1
Interest, insurance, and attendance, 0 5 0		1
19 2 2	-	1
Tora manuna		
At 201 months, —	- 18 12 2	20 0 0

<sup>•</sup> Some items in this estimate differ from the Irish estimate. The calf, hay, and winter attendance cost more. Insurance against death or disease costs less. In this case no credit is given for manure made in summer.

The accompanying diagram will make the figures clearer.

II.—DIAGRAM SHOWING THE COST OF REARING A BULLOCK FATTENED OFF UNDER TWO YEARS OLD.



Summing up, we might say that the present method of raising Irish store cattle results in a loss to the country, and that the loss is incurred by the way these cattle are wintered. To reduce this loss it is suggested that some of the store cattle at present sent to be fattened in England and Scotland should be fattened in Ireland, but that, to prevent it altogether, Irish cattle should be reared so as to be always yielding a profit. This would mean that the animal's value is always ahead of its cost, viz.: somewhere between 35s. and 40s the live hundredweight. At present very few cattle are fattened to this quality in Ireland. In this lies the reason for the country's loss. So soon as cattle are fattened up to this standard the country will begin to gain. More energy, care and capital will be required, more tillage, more labour, and better paid workmen; but the farmer and the country will increase in profit and prosperity.

## FORESTRY.

# I.—THE PLANTING OF WASTE LAND.

The extent of waste land which exists on agricultural holdings in Ireland varies, in the first place, with the physical features of the district in which the holdings lie, and, in the second place, with the actual size of the farms. On good, fairly level, and welldrained land, waste lots are, or should be, comparatively scarce. In hilly or mountainous districts, with thin, gravelly, or rocky soils, the extent of waste land, in the ordinary sense of the word, may equal or exceed that of the closely grazed or cultivated portion. In a general way again, the extent of waste land on any holding will vary with its size or total area, and its relative importance, from an agricultural point of view, increases or diminishes accordingly. Land, for instance, which might fairly be regarded as waste or useless on a fairly large and fertile farm, would probably be considered of some agricultural value on a small holding with poor soil. It is difficult, therefore, to define waste land with any degree of accuracy, as not only the soil itself, but its situation or relative position to other parts of the holding, may affect its agricultural value considerably.

But in all districts it is invariably the case that a certain amount of land exists on every farm which is of such a nature as to be practically useless to the farmer in its natural condition. but which, at the same time, is well adapted for planting with trees. Such land may consist of odd corners in arable fields which cannot be cultivated in the usual way, steep banks or hill sides with too great a slope for grazing cattle, rocky or broken ground practically bare of vegetation, land covered with broom gorse, bracken, or heather, swamps or bogs which cannot be reclaimed for agricultural purposes, &c., &c. By planting all such as are suitable, however, these places may be made to provide shelter for men, cattle, or crops against strong winds or hot sun, to constitute ornamental or picturesque features in the landscape, and to furnish poles, timber, or firewood for use on the farm, or even for It may not be possible to attain all the above objects on every piece of waste land, but it is seldom that the waste corners of farms are unfavourable for the successful growth of most hardy trees, the cultivation of which well repays the slight trouble and expense involved.

To secure successful results in planting, certain conditions of

Conditions requisite for successful portant are—a sufficient depth, and the

Planting. absence of stagnant or excessive moisture.

A sufficient depth of soil or subsoil is not only necessary from the fact that trees are deep rooters, and require a secure hold of the ground to enable them to resist winds; but also because depth ensures the roots being properly supplied with moisture in dry seasons. Trees planted on very shallow soils never attain a satisfactory size, but are invariably short and stunted.

The definition of a proper depth of soil for trees in general is extremely difficult, as so much depends upon the nature of the rock below. When this is loose, porous, and more or less broken up into rubble, the depth of the surface soil is of little importance. When, on the other hand, the under-lying rock is hard and impervious, a certain depth of soil or subsoil is absolutely necessary for successful tree planting. In a general way, it may be stated that a porous stratum, through which the roots can easily penetrate t, a depth of two to three feet, is sufficient for the growth of most tries, less or more being only sufficient for or required by a few.

The absence of stagnant or excessive moisture is a very necessary condition for most trees. In a water-logged soil, the roots are unable to perform their proper functions, while injurious acids may be formed which are often fatal to most kinds of vegetation. Natural drainage, in the shape of a porous subsoil, or, in the absence of this, artificial drainage a year or two before planting, may be considered essential in most cases.

The classes of waste land met with on farms vary considerably,

Classes of Waste Land. but a few of the most numerous forms likely to exist, together with the species of trees best adapted for planting them, may be enumerated. The latter are, as far as the

situation will allow, such as will furnish poles or timber at an early age, or are useful for shade or shelter. In high-lying mountainous districts, the following classes of land are frequently met with:

1st.—Gravelly or stony ground at or over 1,000 feet above sealevel.—Such land as this can hardly be expected to grow big timber, but if naturally well drained, and not too exposed to westerly gales, it is often possible to grow useful crops of Larch,

Corsican Pine, Birch, &c., which can be used for fencing or similar purposes, while the trees will provide shelter for the ground adjoining. As a general rule, exposed land should not be planted above 1,000 feet over sea-level; but on the lee-side of a hill, or the slopes of ravines or gullies, the above-named species may succeed, with fairly open subsoils, up to 1,200 or 1,500 feet. In planting such ground, small-sized plants from six to twelve inches in height should be used, and such as have been raised on exposed ground, with plenty of space between the plants, are able to plants from rich sheltered ground, or those which have been crowded together in the nursery line. close planting should also be adopted, so that the trees may be in a position to shelter each other as soon as possible, and a distance of three to three-and-a-half feet between the plants is usually close enough on such land. Spring planting is usually better than autumn, the months of March and April being better than any, provided the Larch is not too far advanced in leaf in the latter month. The proportion of Larch to Corsican Pine may be as three to one, while Birch and Larch may be mixed in equal proportions. In very sheltered spots Spruce may take the place of the Pine on shallow soils, while where the situation is very exposed, the proportion of Pine to Larch should be increased.

2nd.—Poor sandy or gravelly soils at moderate or low elevations. -This class of land is usually well adapted for most kinds of conifers, and such hard wood as Beech, Spanish Chestnut, &c. its natural condition such land is generally covered with gorse, broom, bracken, or heather, and the existence of the first three is a fair indication of their suitability for planting purposes. Such species as Larch, Scotch, Austrian, Corsican, and Weymouth Pines, Silver Fir, and Douglas Fir, may usually be planted with a fair prospect of success, together with the hard woods already mentioned. On the higher and more exposed ground the pines and larch should predominate, while the Douglas and Silver firs should occupy comparatively sheltered situations. Beech and Spanish Chestnut will succeed best in the warmer and drier soils, and may be mixed with larch. The size of the plants used should be from one to two feet in height, and the distance from plant to plant not more than four feet.

3rd.—Steep banks or slopes with patches or pockets of good soil.

—Slopes of this kind usually form the sides of gullies or the banks

of rivers, and are often the most favourable sites for tree-growing that can be found. The most profitable trees to plant are usually Larch and Ash, especially if the underlying rock consists of lime-stone. On sandstone, or whinstone, Douglas fir will often do well, provided it is not exposed to the full force of westerly winds. Ash should seldom be planted at a higher elevation than 500 feet, and Douglas Fir planted on dry ground only, and in thick compact masses, mixed with Silver Fir or Spruce. On very warm and dry banks Spanish Chestnut would probably prove the best tree at low elevations.

4th.—Wet, peaty ground, or cut-away bog.—On this class of land drainage is absolutely necessary before planting can be successful, while at least a year should elapse between draining and planting. Spruce is usually the best tree to plant on wet land, while Larch will often succeed for a time, and reach a fair size. Where the peaty covering is very deep, Birch and Alder will usually succeed where everything else fails, and Scotch Pine often does well for a time. Climatic conditions and the nature of the subsoil have much to do with the growth of trees on this class of land, and it is difficult to lay down general rules for planting it.

5th.—Swampy land near the edges of lakes, or in river bottoms.
—Willows, Alders, and Poplars are the only kinds of trees likely to succeed on this land. With occasional flooding only, the tree Willows (Huntingdon and Bedford), and the Black Italian Poplar should do well, and if well grown, the two former make valuable timber trees. When the ground forms a perpetual swamp, Alder is about the only tree that can be recommended in the absence of drainage, which is often impossible in such situations.

Other types of waste land may occasionally be met with, but the above are the most common, and any others will usually approximate to one or the other of those specifically dealt with.

The above remarks apply chiefly to the formation of small plantations, varying in size from half-an-acre, or even less, to possibly four or five acres, which should be planted with the idea of their affording as many features of ornament, shelter, and utility as can be obtained by carrying out simple rules and methods associated with practical forestry.

# II.—THE PROPER METHODS OF PLANTING FOREST TREES.

Although the practice of transplanting forest trees from the seed or nursery bed to the site of a plantation or shelter belt is extremely simple, and does not differ in principle from the transplanting of a cabbage or other plant of that nature, failures often result from the neglect of certain rules and precautions which experience proves to be more or less inseparable from success. The principal details connected with tree planting may be divided into five classes relating to—(1st), Fencing the ground against farm animals, hares and rabbits; (2nd), Preparation of the ground; (3rd), Choice of plants, and their removal from nursery to plantation; (4th), Methods of planting; and (5th), Subsequent tending of the trees until fully established.

The fencing of a piece of ground against ordinary farm live stock

Fencing against Cattle and Ground Game. is so well understood in rural districts that it is unnecessary to take up space in describing it. Fencing against ground game effectively enough for successful planting. however, is not such a common detail of

farm work; and as large sums of money are frequently wasted through the neglect of proper precautions being taken against hares and rabbits, the more important details of the work may be described.

It is, of course, quite obvious that the cheapest and best method of dealing with rabbits is that of exterminating them altogether round about the ground to be planted. But when this cannot be done, either owing to the difficulty of reaching them, or to the fact that they exist on adjoining land which is not under the intending planter's control, the use of wire netting is imperative. Where rabbits or hares are numerous, netting of not less than 4 feet in width, and not more than 11 inches in mesh, should be used. This should be let into the ground to a depth of six inches, while the upper edge should be tightly stretched to a wire of the ordinary fence enclosing the ground, or to one specially erected for the purpose. When rabbits are likely simply to travel to the plantation at night from a distance and do not lie in adjoining fields or banks, the use of cheaper netting, 3 feet in width, may be sufficient to keep them out; but unless the planter can exercise sufficient control over their numbers from year to year, the use of narrow netting may prove dear in the long run. Where sheep have to be fenced against, wide netting may often be made to serve in place of several of the lower fence wires, and the total cost reduced to some extent.

This work chiefly consists in clearing off any rubbish or surface growth which might smother the young trees is allowed to remain, and in carrying Preparation of the Ground. away excessive moisture when such exists. Woody growth, such as scrub, gorse, or broom, should be cut and burned the summer before planting, as by so doing, the shoots of the plant are weakened to some extent, and their subsequent growth retarded. In the case of gorse or broom, it is often possible to grub out the old shoots altogether, and this will facilitate the cleaning of the ground afterwards. Bracken should be cut or broken over twice or thrice the previous summer and before the fronds have fully expanded. This will weaken their growth for several years. Rank heather should be burnt, if possible, at least two years before planting, so that the new growth may shelter the young trees to some extent. Other growths, such as brambles, briars, etc., can be dealt with immediately before planting, so that the young trees may start with as clear a surface as possible.

Draining must be carried out by cutting open ditches from the nearest existing drain or watercourse along the low-lying parts of the ground. Open side drains can then be cut from these into wet parts as required. On very wet ground, with little or no fall, shallow drains at intervals of every rod or perch may be required, while a fairly steep slope may be most effectively drained by deeper ditches at wider intervals. As a general rule, plantation drains should have been almost perpendicular sides, and a depth of one to two feet, but much will depend upon the nature of the soil, and the amount of drying required to render the soil suitable for planting. On sour or peaty land, or where autumn planting is contemplated, all draining should be carried out at least six months before planting.

Whatever the species of tree employed, it is very desirable that
the plants selected should possess certain
Choice of Trees and characteristics which are conducive to suctheir Removal. cessful transplanting. They should have stout, short-jointed stems, with well ripened wood and plump buds, and a sufficient number of fibrous roots which can be lifted without difficulty when the tree is moved.

276

When the buyer is unable to inspect the trees in the public nursery before purchase, he should always arrange to have samples forwarded which will enable him to judge as to the bulk. All plants which exhibit a top-heavy appearance when held at arm's length, which have long, weak annual growths, bent or deformed tap roots, or which will not stand perpendicularly in the ground when the roots are properly buried, should be rejected, while stunted or disused specimens should be equally condemned as unsuitable.

As regards size, the most suitable in a general way are plants from 6 to 12 inches in height for high-lying and exposed soils, and from 12 to 24 inches for comparatively sheltered or good ground. In weedy or dirty ground it is sometimes advisable to plant even larger sizes, owing to the rapid growth of the weeds in summer, while, if necessary, many species, such as Ash, Poplars, Willows, Alders, etc., can be planted without difficulty when 4 to 5 feet high.

When received from a public nursery, young trees should at once be unpacked, the bundles in which they are tied opened out, the plants carefully laid in a trench, and the roots covered with loose damp earth, leaf mould, or other material which will prevent the drying of the roots in any way until they are planted. On no account should they be left exposed to sun or wind, or simply allowed to remain for several weeks tied up in bundles until planted, as is often done. Exposure of the roots for any length of time is fatal to many species, is detrimental to all, and is one of the most frequent causes of failure in transplanting.

The most suitable method of planting will depend upon the size of the plants, the nature of the soil, and the surface growth which covers the latter.

With large plants, or such as have long straggling roots, where the soil is stiff and adhesive in nature, or when the surface is covered with thick turf, or a network of matted roots, the most suitable system of planting is that known as "pitting." This method consists in making with the spade a square pit measuring about one foot or so in every direction. All turf, roots, large stones, etc., should be kept, as far as possible, apart from the fine soil taken out of the pit, and the latter used for placing directly in contact with the roots when planting. On stiff soil the pits should be dug in the autumn, and the soil removed given an opportunity to become "weathered" and acted upon by air and

frost before planting is done. On dry or loose soils pitting and planting may be done at the same time, as this is often more convenient.

When planting, the plant should be held with its main roots pointing vertically towards the bottom of the pit, and not doubled or bent at right angles, and the fine soil placed round them as far as it will go. Stones and coarser particles should be filled in on the top, and the whole trodden firmly in with the heel, taking care that the stem is not bruised or skinned when doing this. Attention should also be directed to the plant being placed at the correct depth, which is about an inch or so deeper than the original depth in the nursery, so as to allow for the settling down of the loose soil.

When small plants can be used, and where the soil is light and porous, the method of planting known as "slitting" can be successfully adopted. This consists in making two deep cuts with the spade at right angles, lifting up the soil between them, and slipping in the roots of the tree before the soil is allowed to fall back in its place. Carefully done, this method may be as successful as the other; but unless skilfully carried out, there is great risk of the roots being doubled back or twisted when being inserted. For this reason it is not recommended on a small scale, as, for instance, when two or three acres only are to be planted.

The most important points about tree planting are the position of the roots in the ground, and the firm treading of the soil round about them. Many losses are occasioned by inattention to these points.

The best time of the year for tree planting will depend upon soil and situation. On wet soils and exposed sites, spring planting in February and March is usually the best plan, as the young trees are not long in the ground before the return of warmer and drier weather. On dry soils and sheltered localities autumn planting in October and November may give the best results, as the winter rains settle down the soil and prevent spring droughts affecting the young trees. With all large plants, and especially conifers, however, spring planting is, on the whole, to be preferred to autumn, as the continuous action of the wind on newly-planted trees throughout the winter is very injurious to both tops and roots. This is especially the case near the sea-coast, where the action of salt air has to be taken into account. In wet, clayey, or sticky soils fairly dry weather should always be chosen for planting.

For the first month or two after planting the only work which

of the Trees.

requires doing is to fix upright any trees Subsequent Tending which have blown over or become loosened by wind. In the following June or July any vegetation which is seen to be interfer-

ing with the young trees should be cut over with a sharp hoe, care being taken that the trees are not injured when this is being done. With bracken this may be necessary twice in the year, but if the ground has been properly cleaned previous to planting, one good cleaning should be sufficient during the first summer. the following winter blanks caused by deaths may be filled up with fresh plants, and the following summer the ground again cleared of rubbish, and so on until the trees are out of danger, which will depend very much upon the rate of growth of the species themselves.

If planting be carried out with careful attention to all the above points, success should not be difficult to attain. The three most important things to remember are careful choice of plants, keeping the roots from dry air and sun before, and leaving them firmly fixed in the ground after planting.

# III.—TREES FOR POLES AND TIMBER.

The species of timber trees are so numerous, and the uses to which they are put so varied, that it would be quite impossible to deal with more than a few of the most important of them in an article of this description. An attempt will be made, therefore, to describe only some half-dozen trees, which would be most likely to serve the purpose of an agriculturist who might wish to turn his waste land to account by planting it.

The usual objects of planting for timber production on a farm are, 1st, to utilise lands which cannot be profitably turned to account by cultivation or grazing; and, 2nd, to provide poles and small timber which can be used on the farm for fencing, buildings and repairs, or sold to a local timber merchant.

Species which would most likely answer the above purposes are Larch, Douglas Fir, Spruce, and Corsican Pine amongst the conifers, and Ash, Spanish Chestnut, Alder and Tree Willows amongst broad-leaved trees.\* They will all grow on different classes of

<sup>\*</sup>The term "broad-leaved" is applied to trees with flat leaves, such as those of the Oak or Beech, and is used to distinguish them from conifers, most of which have needle-shaped or narrow leaves.

waste land, and produce at a comparatively early age material which can be used on the farm or sold at fair prices.

Larch.—This tree is well known on account of its rapid growth, its value at almost any age for fencing and other work or for selling as timber when of fair size and good quality. A disadvantage is its liability to contract disease or become unhealthy at any age, but with proper care this can usually be guarded against. Its value when of small size renders it of great importance for mixing with other trees which mature slowly, and which are useless in the shape of small thinnings.

For growing larch successfully, fairly deep, open and porous soils are necessary, such as the sides of ravines, or mountain slopes with a subsoil of rubble or broken rock. Stagnant moisture is usually fatal to it, but water passing rapidly through the soil, or over the surface of steep banks, often appears beneficial to its welfare.

Although larch will grow at high altitudes, it dislikes strong and persistent winds. Situations directly exposed to the southwest should not be planted with larch, except when it is intended to cut them early. It usually succeeds better upon northern than southern aspects, but the nature of the soil may have some connection with this.

When planted as a nurse crop, larch should be mixed with beech or Spanish chestnut on dry, light soils, or with spruce or Silver fir on damp ground. Should it fail, or be attacked by disease, these species can then be allowed to take its place as a crop, and as larch usually fails before the twentieth year or so, if it fails at all, the preservation of the supernumerary species is easily effected.

Larch is most profitable when cut at from 50 to 80 years of age, provided it can be grown sound and healthy for that time. Where long clean poles can be readily disposed of, thick crops of 30 to 40 years of age are often more profitable than older plantations, and especially so on land subject to heart-rot in the timber.

Douglas Fir.—This is one of the fastest-growing conifers in existence, and has the additional merit of producing valuable timber. It closely resembles Larch in colour and durability, but takes longer to mature. Under the name of Oregon Pine, it is imported in large quantities from the Western States of North America.

It requires much the same kind of soil as Larch, but it should be of rather better quality and drier than many soils capable of growing that tree, while lime in the soil is almost fatal to it. It also needs a fairly sheltered situation, and should be planted close enough for the trees to shelter each other after the nurses have been removed. As young plants are still rather expensive to purchase, it is usual to mix them with Larch, Spruce, or Silver Fir to begin with, planting the Douglas Fir about 12 feet apart, or at the rate of 300 trees to the statute acre.

Spruce.—This tree is chiefly useful on account of its ability to grow where deeper-rooting trees die out. It is not so valuable as Larch, but when of clean growth, and comparatively small, it is useful for fencing rails, pit props, and for the inside portions of buildings, such as rafters, partitions, etc.

Spruce will succeed on cold peaty soils, which have either very shallow sub-soils or rest on a bed of stiff retentive clay, such as often exists under bog which has been cut away. On account of its shallow root-system Spruce will grow on such soils better than most trees, as its roots do not penetrate to any great depth. To be of any use as timber, however, it must be grown in thick masses, and kept close until it has reached an age of 30 years or so, when light thinnings may be made from time to time. When grown as a pure crop Spruce is usually cut at about 80 years of age, but when wind has made extensive inroads into it, as often occurs, it may be necessary to cut it earlier.

Corsican Pine.—The Corsican Pine is very similar to the Scotch Pine as regards the properties of its timber, but it grows faster, stands wind and sea air better, and produces a larger and more cylindrical timber bole than the latter.

It will grow as high as any tree of the Pine tribe, but succeeds better on clay or limestone soils than most of them. It does best, however, on dry gravelly soils at moderate elevations. It is a troublesome tree to transplant, as it develops a long bare rootsystem. It should be transplanted comparatively small, either in early autumn or late spring, but never in mid-winter. It may be mixed with Larch or Spruce, as it is chiefly valuable when of large size and containing a good proportion of heartwood.

Ash.—The properties of this tree, whether as timber for sale, or use on the farm, are well known. It is probably the most profitable of all hardwood trees, being of rapid growth, maturing at an early age, and selling at a higher price per cubic foot than most species.

To obtain really first-class Ash it must be grown on fairly damp and good soil, such as is often found in river valleys, or on rocky, but otherwise fertile, land, on the banks of mountain streams. On thin dry soils, or at high elevations, Ash seldom reaches a large size, and usually decays at an early age, while its timber is of little value. It is easily injured by late spring frosts, and is best mixed with Larch or some other tree which will shelter it to some extent in youth.

A great deal of Ash timber is spoilt through allowing it to stand-too long upon the ground, and until it has become black-hearted, and the timber brittle. Even on good land Ash should rarely stand longer than 70 or 80 years, and on inferior Ash soils it should be cut much earlier. When long and clean, with the timber perfectly white throughout, Ash usually makes a good price, and should repay the cost of growing it.

Spanish Chestnut.—This tree may be regarded as a fast-growing Oak, as it possesses many of the properties of the latter tree in the way of strength and durability, but without its slow growth. For outdoor work, such as gate posts, posts for open sheds, etc., this tree is especially valuable, as it contains very little sap-wood, and can be used at an age when Oak is almost worthless. It should, however, be cut not later than 50 to 60 years of age, as the timber is liable to become shaky late in life, and is often quite worthless on that account.

Spanish Chestnut likes deep, warm, dry ground, such as may often be found on sunny banks, or on sandy or gravelly soils. At high altitudes, or in low damp situations, it often fails to ripen its wood, and it should not be planted in such spots. It does well mixed with Larch, and if cut over fairly early will produce a crop of stool shoots which will grow into poles and small timber of great value for fencing purposes.

Tree Willows.—The two Tree Willows of any value are those known as the Bedford, or Crack, Willow and the Huntingdon, or White Willow. Many varieties of these two willows exist, but it is doubtful if their value as timber trees varies to any great extent. Their value lies in the demand which exists for timber for manufacturing cricket bats, and their suitability for this purpose depends upon a certain degree of toughness peculiar to the age and growth of individual trees, and which does not appear to be universal. When of the right quality very high prices are given for Willow wood, and on certain classes of land it should prove a profitable tree.

The Bedford, or Crack, Willow will grow on rather stronger ground than the Huntingdon, and is altogether a more vigorous growing tree. Both varieties, however, thrive best on good alluvial soil, which is occasionally flooded without being water-logged, such as that on the edges of slow-running rivers. They may either be planted with rooted plants put in about six feet apart, or strong, healthy shoots, with the twigs left on, may be stuck into the ground, in spring. Owing to the rank surface growth which usually exists in such spots small plants are quite useless, and would be smothered before the end of the first season.

Alder.—The Black Alder is valuable as a tree capable of growing on perfectly water-logged swamps on which no other tree can exist. The wood is chiefly used when of comparatively small size for clogmaking, turning, &c., and a fair demand exists for it in some districts.

It should be planted about six feet apart, and cut about 20 years of age, when it will throw up a new growth of stool shoots, which are straighter and more vigorous than the main stem. Alder coppices are usually cut over about every 15 years, and the poles are often useful for temporary repairs to fences and buildings. When planting this tree, wire netting against rabbits is unnecessary, as they rarely, if ever, damage it sufficiently to endanger its existence.

On such soils as suit the Willow and Alder, Black Italian Poplar will often succeed, but its timber value is very small, and the demand for it uncertain.

For particular soils and situations, other species than those mentioned above may sometimes be suitable, but a very few are of sufficient value to render their cultivation on a small scale profitable.

## IV.—TREES FOR SHELTER AND ORNAMENT.

Many forest trees are equally adapted for timber, shelter, and ornament, while others are chiefly important from the fact that their characteristic features render them better adapted for one of these purposes in particular, rather than a combination of all three. As trees adapted specially for timber growing are dealt with in Section III., p. 278, it is unnecessary to enumerate them here, but it may be pointed out that even these are of great value for both shelter and ornament under many conditions of soil and situation. In certain situations and under certain circumstances,

however, an attempt to obtain timber, shelter, and ornament at one and the same time will often end in failure. In such cases it is best to pay attention to only one of the features mentioned, and to plant trees best calculated to attain the end in view.

In this climate, shelter is chiefly required against cold or strong winds, or from hot sun. In the latter case, shelter is only needed by grazing-cattle or for dwelling-houses for a few weeks in the year at most, and it is rarely, if ever, necessary to plant trees specially to provide it. But in exposed or wind-swept districts, shelter against strong, or cold and dry winds is absolutely necessary if comfortable quarters are to be secured for cattle feeding in the open throughout the year, or attractive sites provided for farm houses or cottages.

Trees adapted for providing shelter in exposed positions must be capable of standing against the worst gales that blow, must retain their leading shoots under the influence of persistent winds, and their lower branches late in life, and must grow at a fairly rapid rate under more or less unfavourable conditions.

It is obvious that very few trees can fulfil all the above requirements, and produce, at the same time valuable timber, and where shelter is of paramount importance, trees capable of providing it effectively must be selected in preference to all others.

The following are the principal species suitable for planting where shelter against wind is the chief object in view:—

Austrian Pine.—Whether for planting in the vicinity of the sea, or on exposed ground inland, no tree gives more effective shelter than this. It develops a stout and strong root-system, and a thick, well-furnished evergreen crown, and on that account is quite as effective in winter as in summer. It succeeds best on strong or limy soils, but, as a general rule, the nature of the soil is of little importance so long as it is fairly dry.

To secure well-developed crowns it should be allowed abundance of space from the first, and should never be planted thickly at the outset, although the ground between the trees may be filled up with hardy shrubs or low trees which will not seriously interfere with the Pines.

Austrian Pine should be transplanted in early autumn or late spring, rather than in mid-winter, especially in districts at all subject to strong dry winds. Plants from  $1\frac{1}{2}$  to 2 feet are usually the best size, and should be stout and well rooted.

Mountain Pine.—One type of this tree assumes the form of a spreading bush, while another attains to the size of a small tree. They are known respectively as Pinus montana var. pumilio, and P. montana var. uncinata. Both are extremely hardy, will grow on almost any soil, and are especially useful in cold, moory, and peaty soils which are unsuitable for many trees.

The bushy form makes a good shelter mixture with the Austrian Pine, planting the latter either behind it or amongst it as isolated trees.

Sycamore.—This may be considered the best wind-resister of all broad-leaved trees, whether near the sea or elsewhere. It attains a greater height than the Austrian Pine, but does not present such a close unbroken front near the surface of the ground, while, being deciduous, it provides little shelter in the winter. It is useful, however, where space cannot be spared for low-spreading trees, or for mixing with lower-growing trees in a small belt or screen. It requires fairly deep and good ground to bring it to a large size, but when it does attain large dimensions it is often a valuable timber tree.

Beech.—On dry soils Beech usually makes a good shelter tree, although taking up a good deal of room in old age. For filling up old belts or screens, however, it is often very useful, as it stands shade well, and the young trees retain their leaves through the winter, though in a dead condition. It is probably best to plant it in thick masses or groups here and there where its shade will do not harm; but it is a bad hedgerow tree, unless it be planted as a hedge itself, when it often provides the best of shelter. Being deciduous at a mature age, it requires the company of conifers to make a complete shelter.

White American Spruce.—This is a much hardier tree in exposed positions than the common spruce, although of little value as a timber tree. On high-lying moory soils, however, it makes good shelter in the form of a thick row or belt, but it should not be mixed with tall-growing trees, or it will quickly get crushed out.

Birch.—Birch is chiefly valuable as a shelter tree when fairly young and closely planted. It is very hardy, grows on any soil and at any altitude, but seldom attains a great size or age, and is chiefly mentioned because it is easily obtained, and may aid in sheltering other species during the early stages of growth.

Poplars and Willows.—On wet ground, and at moderate elevations, the Black Italian Poplar and Tree Willows are often useful in quickly providing shelter. Good drainage, however, is desirable, so that their root-hold may be secured as much as possible. They cannot be considered in the same order as the trees named above, so far as shelter is concerned, but may produce useful timber, and sufficient shelter for low-lying spots, and may assist in drying spongy ground. Both species will thrive near the sea.

On fairly good or low-lying ground many other species will succeed as well, or even better, than the above. But in such cases it is usually possible to plant ordinary timber trees which will provide both shelter and timber at the same time, particulars of which, as already pointed out, will be found in Section III.—Trees for Poles and Timber (p. 278).

In one sense all well-grown and normally-developed trees are ornamental, and it might be thought un
Trees for Ornament. necessary to specify any species in particular under this head. But for situations in the immediate vicinity of a dwelling-house of any size, trees are often features in the landscape which give dignity and importance to their surroundings, and for such purposes certain species are far more suitable than others.

The chief characters of an ornamental tree are grace, symmetry of outline, and varied details in leaves, flowers, or fruit. It must also harmonise with its surroundings sufficiently to enable it to be regarded as an appropriate object of interest when looked at in relation to them rather than by itself.

It is not intended to deal with trees which might be appropriate in a park or pleasure-ground, but only such as are suitable for planting in a small garden, or on a piece of lawn in front of a farm house where the space is necessarily limited. For such a purpose many of the ornamental conifers are the most suitable and appropriate. They have a symmetrical outline, are evergreen, and rarely grow to a size which renders them unwieldy and ultimately dangerous to the house itself, or an obstacle to free circulation of air or to the sun's rays.

To enumerate all the trees that might be considered suitable is impossible here. The following will, however, generally be found to meet all requirements:—,

Abics nobilis.—This tree likes a deep, well-drained soil, and on such it is fairly hardy and fast growing. It should not be planted in low frosty hollows, as its young shoots are rather tender. It has a beautiful silvery hue, and a perfect outline when healthy.

Tsuga Mirtensiana.—On fairly light, dry soil this makes a beautiful tree, with dark green feathery branches which clothe the stem to the ground. It grows rapidly, and provides a good deal of shelter on a north aspect.

Cryptomeria japonica.—This is a Japanese tree of moderate size, and is very ornamental when mature. It succeeds on most soils, and does not produce such a dense mass of foliage as many conifers.

Cupressus Lawsoniana.—A well-known tree of moderate size, grows almost anywhere, and makes a good screen or shelter when planted in a row about eight feet apart.

Thuia gigantea.—Stronger and faster growing than the last, but wants more room as a specimen.

Wellingtonia gigantea.—Usually does well on clayey soils, and is very hardy, but often gets bare at the bottom.

Amongst broad-leaved trees, the following are useful:-

Robinia pseud-acacia.—This tree has very ornamental foliage and flowers, and its timber is the most durable in existence. It likes light sandy soil, and where a low screen is wanted may be cut to the ground every twenty years or so.

Quercus Ilex.—This evergreen makes a thick-bushy head, without growing to a great height. It does well near the sea, and bears cutting back when required to be kept low.

 $Mountain\ Ash$ .—This is an easily grown tree, and very ornamental, and may be useful in exposed situations where other trees cannot be grown.

For many situations certain of the larger shrubs are more suitable than trees.

# V.—PLANTING, MANAGEMENT, AND PRESERVATION OF SHELTER-BELTS AND HEDGEROW TIMBER.

The importance of shelter-belts and hedgerow timber to the farmer and stock-breeder is probably greater in a country where a large proportion of the agricultural land is under grass than where it chiefly consists of arable or cultivated land. In a country swept by westerly gales with such frequency as Ireland, the successful breeding and feeding of live stock greatly depend upon the artificial or natural shelter afforded by buildings, shelter-belts.

or hedgerow timber through the winter months; for where shelter is absent, it is almost impossible to winter farm animals without injuring their health or reducing their condition to an unprofitable extent.

While artificial shelter in the form of open or closed sheds is the most complete, it is also very expensive. Natural shelter, on the other hand, in the shape of shelter-belts or timbered hedgerows, is comparatively inexpensive, and further reaching in its effect; it benefits both the stock and the grass upon which they depend. Experiments and observation prove that the influence of such obstacles as trees to wind currents is very considerable, and it has been calculated that the sheltering effect extends ten feet on the horizontal for every foot in height they rise above the surface of the ground. As a properly developed tree or shelter belt may attain a height of 80 or 100 feet, it is obvious that this form of shelter has a broader influence in counteracting wind currents than that exerted by buildings. It is also a well-known fact that the wind is broken to a greater extent by trees than by more solid bodies, such as walls, which may temporarily check its force, but lead to the formation of gusts or eddies above or around them.

Bosides acting as wind-breaks, trees provide shaded air spaces in hot, sunny weather, and they thus not only afford direct shelter to cattle, but they tend to reduce the temperature and increase the circulation of the air on a still day. The existence of a few trees in proximity to farm-houses or cottages does much to render them pleasant and agreeable habitations, while their effect upon the landscape, although it may be of no practical value to agriculture in itself, is of great importance from the residential point of view.

Assuming that trees form a desirable, if not absolutely necessary, feature on agricultural land, the best form

Form and Position for them to take, and the best position for them to occupy, may be considered. On a farm of average size, in order to obtain efficient shelter it may be necessary to provide clumps, belts, and hedgerow trees. Clumps should occupy land which, owing to its position or the condition of its surface, cannot be profitably grazed or cultivated, but which is otherwise capable of growing timber trees. In some cases such clumps may be made to grow timber, firewood, &c., and thus serve other purposes than shelter alone.

Their extent, shape, and the species of trees which should be planted in them, will vary widely, but no general rules can be laid down regarding them here.\*

Belts are usually planted with a view to shelter alone. They are most suitable for high-lying exposed ground, where it is desired that the maximum extent of land shall be sheltered. Belts are often objected to on account of the great length of fencing required to enclose a small area; but this may be sometimes partly avoided by planting them alongside existing hedges or fences. The efficiency of belts for shelter purposes depends greatly upon the species of trees with which they are planted, and upon their subsequent management. Many belts are useless after a time through inattention to these details.

In laying out belts, a line should be taken more or less at right angles to the direction of the prevailing wind. In hilly districts this will often vary with the configuration of the ground. broad valleys winds are often most violent when sweeping up or down and the belt must be planted accordingly. As regards width, twenty to thirty yards is a good distance, for if the belts be too narrow, the trees rarely grow to a great size, and the benefit derived from them is proportionately less. The most suitable species of trees are those with thick, well-furnished crowns which retain their lower branches late in life. Such are Austrian Pine, Beech, and Sycamore, with Corsican Pine and Silver Fir in the centre. Larch may also be planted freely at the outset, but they should be taken out fairly early, so as not to interfere with the legitimate trees. Belts are also more effective when such bushy evergreens as Holly, Mountain Pine, or Laurel, are mixed with the trees, while it is also important to allow the two outside rows ample space from the first, so that they may develop well-furnished crowns reaching down to the ground.

One of the most useful forms of shelter plantation is that combination—a clump and a belt which is often planted round the homestead or farm buildings to protect it from the fiercest and most prevalent winds. Such plantations need not be of any particular shape, but they are probably most useful in the form of an irregular crescent-shaped belt, with its concave side facing the buildings and its greatest width at the centre. Occasionally it may be desirable to extend this belt, so that an adjoining paddock

<sup>\*</sup>See ".The Planting of Waste Land," p. 270.

or field may receive the benefit, for it is in such spots that young stock usually gain their first experience of outdoor life, and, possibly, pass their first winter.

Belts or clumps are frequently met with which are absolutely

# Filling up old Belts.

useless for shelter, either owing to their thin and gappy condition, or to their having been formed of larch or other trees which do not provide a proper screen against the

wind. When the existing trees are still young or immature, it is often advisable to plant between or below them with a view to filling the space near the surface of the ground. For such purposes, Beech, Spruce, Silver Fir, Holly, Laurel, and Rhododendron, all of which grow under moderate shade, are suitable. In some cases it may be possible to take in an additional strip of ground in front or behind the original belt; the more rapid growth of the trees will usually repay the cost and trouble of doing so.

Hedgerow trees in combination with hedges is a form of shelter most suitable for good and fairly low-lying

Hedgerow Timber. ground where the space necessary for shelter-belts or clumps cannot well be spared. It

is especially adapted for rich grazing land, where the trees have a natural tendency to grow straight and tall, and the hedges strong and vigorous, and where the soil is deep and fertile enough to bear the extra demand made upon it by trees, hedges, and turf. In a purely arable district, hedgerow trees are rarely favoured, for obvious reasons, but objections to them on pasture land are only justified when they consist of unsuitable species, such as Beech, Hornbean, and similar trees of a low-spreading habit, which kill the hedges beneath and shade the surrounding ground to an excessive degree. But with suitable species, such as the English Elm, Sycamore, Black Italian, and White Poplar, and in some cases Oak and Ash, and with proper attention to the selection and pruning of the trees, many of the objectionable features often associated with hedgerow trees may be prevented.

In selecting hedgerow trees from suckers or seedlings which have sprung up in hedges, only those with straight stems and strong, vigorous leading shoots should be allowed to remain. All crooked and bushy-headed saplings should be cut out at once, as they will turn out useless for timber trees, and will probably do much damage to the crops and hedges beneath. As the selected trees increase in height, the lower branches should be carefully

pruned off from time to time until the lower part of the stem is clear to a height of fifteen to twenty feet. Above this height branches rarely do much harm, but if necessary they may be shortened back if getting too far away from the trunk. Double leaders should be removed at all stages of growth.

It is often better to leave hedgerow trees in groups of five to ten standing closely together than as single trees at regular distances. Standing in groups, they have a greater tendency to grow taller and straighter, with fewer side branches, while they also provide more efficient shelter, and are easier dealt with when the time comes for their removal. In the corners of fields, hedgerow trees may often take the form of a small clump. The trees must be fenced off, however, to prevent damage by cattle.

When trees are planted in hedgerows only stout, well-rooted plants should be used, from five to eight feet high, and it is usually better to plant in the line of the hedge than a few feet away, as in the latter case damage is often done by cattle rubbing against the trees, or by horses eating the bark when the guards have been removed or have fallen away. Three stout posts, driven in on the field side of the tree, and strips of wood nailed across to form a kind of open cage, will usually be sufficient protection for the first eight or ten years after planting.

#### VI.—THE MANAGEMENT OF PLANTATIONS.

It often happens that plantations which have been carefully planted to begin with fail to produce useful timber in the later stages of growth. In some cases this is due to the young trees being stifled by a rank growth of weeds and rubbish before they have attained a sufficient height to place them beyond the reach of this danger, in others to interference with the normal development of the plantation, while it may sometimes happen that certain conditions of soil and climate exist which may prevent satisfactory results being obtained. In the latter case, little can be done to avoid failure beyond the careful choice, at the time of planting, of species which have proved themselves suitable under given conditions. But in connection with the management of the plantation, it is often possible to discover causes, which have prevented the trees attaining that size and quality which are essential to render them of a useful or saleable nature.

In the management of an ordinary plantation, the following operations are usually needed between the time of planting and the period at which the trees reach maturity:—1st, Cleaning; 2nd, Pruning; 3rd, Thinning; 4th, Attention to Drains, Fences, &c. Occasionally other kinds of work are needed, but the above practically comprise all the essential operations connected with sylviculture, or cultivation of woods for the production of timber.

Cleaning consists in cutting away all weeds and surface growth which are likely to interfere with the upper parts of young trees during the first four Cleaning. or five years after planting. It is almost always necessary on ground covered with rough grass, bracken, broom, gorse, brambles, and other growth of that nature. ground properly cleaned to begin with, one cleaning annually should be sufficient if done at the right time, but much will depend upon the size of the trees when planted, their subsequent rate of growth, and the character of the surface rubbish. usually troublesome for the first year or two after planting, bracken for about the same length of time, or sometimes longer. while broom, gorse, brambles, or stool shoots may sometimes require cutting back for at least five years, or until the trees are from six to ten feet high.

This work should always be done in the summer months, preferably in June or July, when the growth is soft and pulpy and before sufficient time has been allowed it to do any damage. A broad hoe is the best tool to use, as there is less danger of damaging the young trees than when a sharp-edged tool, such as a reaping-hook, is employed. Near roads or railway lines the cutting down of this surface growth is often desirable with a view to prevent fires, which may break out in the rubbish, from spreading throughout the plantation.

Trees left to themselves often form double leaders when the leading shoot happens to be damaged by Pruning. wind, frost, insects, or any other means. This is especially likely to occur with such trees as Ash, Oak, and other broad-leaved species, and occasionally with conifers, such as Silver Fir or Douglas Fir. By looking over the plantation occasionally, and pruning off one of the superfluous leaders on such trees, they often grow into perfectly normal stems, or sufficiently so to produce useful timber.

Pruning is also useful in the form of taking off dead branches from the stems of the most valuable trees, as this renders the timber cleaner, and prevents the formation of a large number of dead knots. Several branches should be cut neatly off—with a hand or pole saw—level with the stem, so as to leave no projecting snags: care being taken that the stem itself is not cut into in any way. Larch can usually be cleared of dead branches by giving them a sharp blow with a stout stick.

The pruning of living branches is rarely desirable in a plantation, but may be required occasionally on the margins, when branches become troublesome by overhanging hedges or roads. In such cases only branches of not more than three or four inches in diameter should be cut close in, larger ones being shortened back to a fairly strong fork.

The object of thinning is to reduce the number of trees on a given area as they increase in size and age, until each tree has sufficient space for its proper development. This space increases

with the age of the trees up to a certain period, after which, practically, it is not further extended; but the space required for a tree at any given age will vary with the species, soil, situation, and class of tree it is desired to grow, so that any attempt to lay down precise rules as to the distance between the trees, or the number of trees per acre, is usually misleading.

In timber crops consisting of one species only, and which have been planted or sown thickly on the ground, the trees will thin themselves if not interfered with. This is brought about by the gradually killing off of the weaker and smaller individuals by the larger and more robust. In a crop which, for instance, originally contained from four to five thousand trees per acre, this process of natural selection will go on so rapidly on good ground that not more than half that number will be found alive at the end of twenty years, and the majority of these will be so weak that they will be unable to live more than a few years longer: being eventually killed off in their turn by the stronger trees above them. A certain proportion of the latter, however, will gradually assert themselves until they have secured room for their unrestricted development, and if these happen to stand at a fair distance from their neighbours, they may acquire a wide and deep crown through the absence of side pressure. The result of this may be that the crop will eventually consist of a small number of large and coarse

individuals, with a comparatively large number of tall, clean, but undersized poles. Such a crop does not produce the maximum quantity of first-class timber per acre, as most of the trees are either too rough and branchy, or too small in girth to meet commercial requirements. It is with a view to correcting and finding a remedy for this condition of things that thinning should be carried out. By carefully regulating the distance between trees of the same size, it is possible to produce a fairly uniform and well-developed crop.

The general course which should be followed in thinning an ordinary plantation is as follows:-Where the trees have been planted 3 to 4 feet apart, to begin with, the first thinning is usually required when the average height of the trees is from 15 to 20 feet. At this stage many of those originally planted will have been partly or entirely smothered by the strongest and most vigorous individuals, and the first thinning should take out these smaller trees, together with any damaged or sickly individuals in the larger class. In a mixed plantation attention should also be directed to the most valuable species, and care taken that they have sufficient space for their healthy growth. Where Larch has been mixed freely throughout the plantation, most of the early thinnings will consist of this tree, which can be used for stakes and fencing-rails. But care should be taken that the finest trees are not taken out for this purpose alone, as this is often the cause of unsatisfactory plantations.

Further thinnings on the above principle may be carried out at intervals of from five to ten years until the crop is from forty to fifty years of age. About this time the growth of the leading shoot will begin to shorten, and little or no increase in the length of the clean stems will take place. At this stage slightly heavier thinnings may be made, and not only the small and undersized trees removed, but also a certain proportion of the larger class. The object of this is to provide the bulk of the latter with sufficient space to enable them to increase in girth, and add thickness to the length of clean stem already formed. This can only be effected by the development of the crowns or leafy portions of the heads of the trees, which takes place in a lateral direction when space is given them.

These later thinnings should be carefully made, so that the wind may not enter the plantation through large openings in the crowns. All the strongest and best-shaped trees should be retained as the main crop. As a rule, the number of trees which should remain on the ground after the final thinning should be from 200 to 300 per statute acre, with such species as Larch or Pines, while Spruce or Silver Fir should carry more, and Ash or Douglas Fir less. But, as already pointed out, figures of this kind can only be approximate, and will depend upon the size and development of the trees.

Species which require most attention in the way of thinning are Larch and Ash; next come Pines; while Beech, Spruce, Silver Fir, &c., should be thinned only very lightly until the later stages have been reached, or the timber may be coarse. Where timber of small size is wanted, as for fencing or pitwood, thinning might be almost neglected entirely, but in such cases the crop must be cut early.

Many plantations on wet ground are ruined through neglecting to keep open the drains which were formed

Attention to Drains, Fences. &c. when the trees were planted. In many cases it is found that the trees themselves, by the penetrating action of their roots,

have rendered this work unnecessary. But on flat, low-lying ground, with a clay subsoil, water often collects in drains when they are allowed to block up at the outfall, or fill with leaves or rubbish. In such cases the soil gradually becomes water-logged, and the deeper roots of the trees are unable to perform their proper functions and ultimately die.

When water is noticed to lie in drains after several days of dry weather, it is usually a sign that they require attending to if the crop is to remain in a healthy condition.

The maintenance of hedges and fences in a condition to keep out live stock is an obvious duty, but one frequently neglected. For the first twenty years or so after planting, the entrance of heavy cattle is fatal to a young plantation, and in all cases where it occurs it must be considered a serious matter.

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# SOME COMMON PARASITES OF THE SHEEP.

## MITES, TICKS, AND INSECTS.

Our domestic sheep may be infected by many kinds of small animals living in or on their bodies as parasites—that is to say obtaining food from the blood or other juices of the sheep, and thus living at their expense. An animal which harbours parasites is called by naturalists the "host," because it provides them with food and shelter. We cannot believe that such provision is made willingly by the host, which not only receives no benefit in return, but is often seriously injured through the drain on its system, and sometimes killed by the parasites. The multiplication and crowding together of animals that have been domesticated has led to a great increase in the numbers of their parasites. A knowledge of the life-history and form of these parasites is therefore of importance to the flock-master who wishes to protect the beasts under his care from disease.

Many well-known worms, such as the Liver-fluke and various thread-worms, are dangerous parasites of sheep. In the present article, however, attention is drawn only to those sheep-parasites that belong to the great primary division of the animal kingdom, whose members are distinguished by a firm outer skin and jointed legs. Two classes of these animals are represented on sheep. The "spider-animals" (Arachnida) have eight legs, and their head is not distinct from the trunk; to this class belong Mites and Ticks. The true Insects have a distinct head and only six legs; they include, therefore, Keds and Lice, as well as the various Flies whose maggots live at the sheep's expense.

The common "scab" of sheep is caused by the presence on the diseased animals of multitudes of small mites, The Scab-Mite.

each, when fully grown, only  $\frac{1}{40}$  or  $\frac{1}{60}$  of an inch in length. These mites have stout, rounded bodies, the male (fig. 1), being relatively shorter and broader than the female (fig. 2), and bearing behind a pair of stumpy processes, each with three very long bristles. In both sexes there are four pairs of jointed legs. Of these the hindmost pair in the male are very short, and without the three-segmented sucker-feet found on the other legs; while in the female the legs of the third pair have no foot-segments, each leg carrying at its tip two excessively long curving bristles.

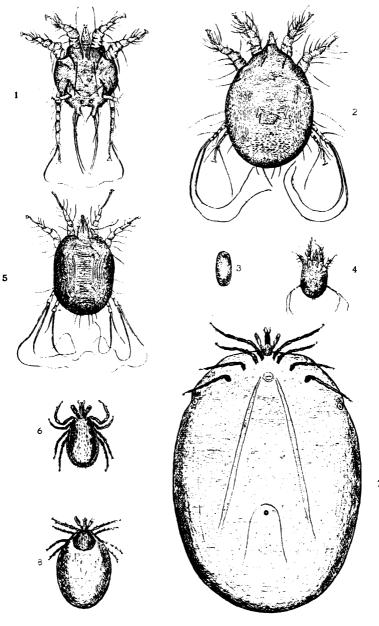
Both males and females have their jaws in the form of barbed piercers (figs. 1-2), which can be worked to and fro. By means of these the mites cut into the skin of the sheep on which they live, causing great irritation, bleeding, and the discharge of fluid (serum), which hardens to form the crust or "scab" beneath which the mites shelter. They attack the woolly parts of the sheep, and the wool becomes matted and soiled, finally falling off. If not checked the mites multiply and spread over the body of the animal, causing the formation of the scabby and cracked skin wherever they go.

The female mite lays about twenty eggs (fig. 3), which are attached to the skin or wool of the sheep. In less than a week the tiny six-legged young (fig. 4) are hatched; after casting its skin the young mite gets its hindmost pair of legs (fig. 5), and it becomes fully grown and capable of pairing about ten days after hatching. It can be understood from these facts of their life-history how rapidly the mites must increase in numbers. Both the mites and their eggs can live for two weeks or longer when removed from the sheep. In this way fences, posts, and other objects against which sheep rub may become infected, and it is likely that mites are carried from diseased to healthy sheep by rooks and other birds.

True ticks are the comparatively large smooth-skinned eightlegged creatures which may be found sucking blood from sheep, cattle, and other
animals, usually attaching themselves at
the base of the legs where the skin is delicate, and where they
cannot be reached by the teeth or tongue of the beast on which
they are feeding.

Both male and female ticks are to be found on sheep and cattle. The male (fig. 6) is smaller than the female; this is especially noticeable after the female has taken a full meal of blood and has become swollen with numerous eggs, when her body assumes an enormous size, the skin being leathery in texture (fig. 7). The mouth of the tick is provided with two pairs of barbed piercers, which penetrate through the skin of the sheep, and enable the tick to suck blood. If the tick is violently removed the piercers are usually left behind. The male tick also uses this piercing beak in the act of pairing, and female ticks are often found on sheep with males clinging beneath them. The female finally drops to the ground and there lays over 2,000 eggs among the rough herbage. After about eight weeks the little six-legged young are hatched from the eggs. They wait for the opportunity of attaching themselves to a sheep or

#### SOME COMMON PARASITES OF THE SHEEP.



SCAB MITE (Psoroptes communis). Male, seen from beneath. Magnified sixty times.
Female, seen from above. Magnified sixty times.
Egg. Magnified 160 times.
Young, strikt stage. Magnified 160 times.
Young, second stage. Magnified 160 times. Fig. 1. 2. 3. 4. 5. After Salmon and Stiles. U. S. Dept. Agric.

TICK (Leodes reducius).

Male, seen from above. Magnified eight times.

Female, seen from beneath: the body is largely distended with blood and ergs. Magnified eight times.

Young in the second ("nymph") stage, after a meal of blood. (Before feeding the Tick is only slightly longer than the dark shield on the back). Magnified eight times.

other passing animal, and after feeding for two or three days, fall to the ground again. Then they cast their skin and become eight-legged "nymphs" (fig. 8). In this stage they again wait for a chance of blood-sucking; then after another few days' residence on a sheep, they drop off, change the skin, and become fully grown. Once more they now wait for a passing animal from which they can suck blood, and on which they live for some time, the female becoming greatly swollen as explained above. In their various stages the ticks are able to live for a long time (six months to a year) without taking food, and their growth depends upon their finding in each stage a "host" animal from which they can suck blood.

In addition to the irritation and loss of blood caused by ticks, they convey, in many cases, minute parasites from the blood of diseased to the blood of healthy animals, and thus spread most serious illnesses (such as redwater in cattle). It has been shown that in some diseases a female tick may suck blood from an infected beast, and her young, in their early stage, convey the infection to a healthy animal. And as the parasites remain in the blood of animals after they have recovered from the disease, the risk of infection is very serious. "Louping-ill" in sheep is probably spread by ticks from diseased to healthy animals.

Keds, which are the familiar, hairy, wingless, six-legged parasites of sheep, are often called "ticks." No confusion is possible if it be remembered that the true ticks have smooth, horny or leathery skins and eight legs.

The keds (fig. 9) are in reality degraded flies, their structure and life-history showing that they belong to the same family as certain two-winged flies, which live as parasites on horses and birds. The keds being quite wingless, spend all their time clinging to the wool of their host—for which their strongly-clawed feet are admirably adapted; they only occasionally migrate from one sheep to another, or, after shearing, from sheep to lambs. The life-history of these insects is remarkable; the egg is hatched within the body of the female and there grows into a fully-developed maggot, whose skin, immediately after birth, hardens and darkens to form the firm seed-like pupa-case (fig. 10), within which the ked comes to maturity. The same female is able to produce five or more young, successively. The pupa case is often hidden by a whitish sticky incrustation which probably serves to attach it to the wool (fig. 10).

Keds possibly suck grease from the wool of the sheep, but they feed principally by piercing the skin and drawing blood, so that when present in numbers they may cause much loss to the animals and even, in the case of lambs, death. As their whole life history is passed on the sheep's body, keds can be readily exterminated with proper care.

The nostril fly seems to be very uncommon in Ireland. It is about 1-inch long, slightly hairy, mottled with black, grey, and yellow markings, (fig. 11). It be-The Nostril Fly. longs to the same family as the Ox Warblefly, and like that insect, has its jaws undeveloped, so that it cannot bite. In July or August the female either lays eggs, or deposits tiny maggots already hatched within her body, around the sheep's nostrils; the maggets soon make their way into the nasal cavities, travelling by means of mouth-hooks, short spines on the body segments, and a prickly process at the tail-end where the conspicuous air-holes are situated (fig. 14). They attach themselves by their mouth-hooks (fig. 13) to the living membrane of the sheep's nasal cavity, and feed on the mucus through the autumn and When fully grown (fig. 12), they are 3-inch long; then they crawl down into the nostrils, causing great irritation, and the sheep having expelled them by sneezing, they fall to the ground. Under some shelter the maggot-skin hardens to form the smooth dark pupa-case within which, through a period of three or four weeks, the fly comes to maturity. It is generally during March, April, or May that the maggots leave the sheep's nasal cavities.

The sheep maggots, which are too often found biting the skin and devouring the flesh of living sheep and lambs, are the young of bright metallic green and Sheep Maggots. violet flies known as "green-bottles" (Lucilia sericata and L. cæsar). It is often stated that the common dull, steely "blue-bottles" (Calliphora) also produce sheep-maggots. It may be so, but no proof has yet been furnished, while the attack has been repeatedly traced to the "green-bottles." The female fly (fig. 15) lays her eggs in clusters of about fifty on the wool of the sheep, fastening them to the hairs—a single fly may lay as many as In Ireland egg-laying usually begins in May or June, and the mischief is greatest during July and August. The fly seems to prefer sheep whose wool is greasy, or whose hindquarters are soiled. Lambs and young sheep are more subject to attack than old ones, and lame or sick sheep than healthy ones. A few years ago

# SOME COMMON PARASITES OF THE SHEEP.

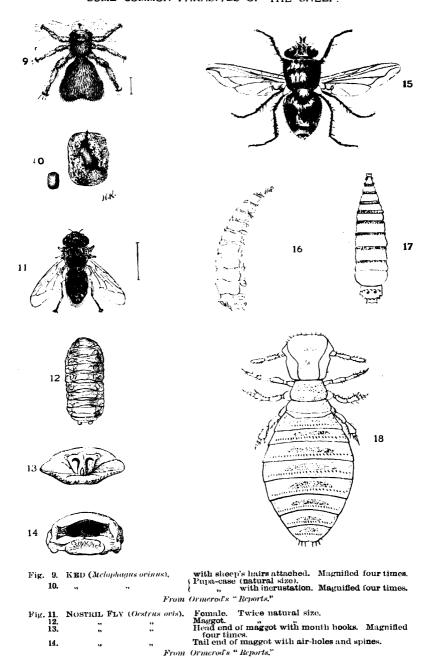


Fig. 18. BITING-LOUSE (Trichodectes spharrocephalus). Magnified twenty times.

After Osborn, U. S. Dept. Agric.

GREEN-BOTTLE FLY (Lucilia Female. Magnified three times.

Maggot, side view. Magnified three times. Maggot, view from above. Magnified three times.

Fig. 15.

16. 17. sericata).

the sheep-maggot was troublesome only in low-lying, rank, shady pastures; but now sheep on hill-grazings are often attacked.

The maggot (figs. 16-17), tapers towards the head end, where there are powerful mouth-hooks, which tear the skin and flesh of the sheep; at the broad hinder-end are the air-holes through which the maggot breathes. It becomes fully grown (about ½-inch long) in about a fortnight; then the maggot-skin hardens to form the brown barrel-shaped pupa-case within which the fly develops. If the maggots are allowed to continue their attack on the sheep unchecked the animal will almost certainly be killed, and it has been found that sheep which have been once "struck" are, even if cured, more liable than others to be attacked again. There are repeated broods of flies and maggots through the summer. Every neglected "maggoty" sheep, alive or dead, is a centre of infection for the surrounding neighbourhood.

The common "Lice" found on sheep are not true bloodsucking lice, but belong to a quite distinct
Biting-Lice. group of insects, the Biting-lice, so-called because they are furnished with jaws by means
of which they bite the hairs, or the surface and secretions of the skin
of their hosts, and thus get food. They may possibly draw blood
at times, but they do not possess the powerful piercing and sucking
beak of the true lice. The kind which lives on the sheep (fig. 18)
belongs to a family, whose feet, provided with strong claws, are
specially adapted for clinging to the hair of their host's body,
where they lay their eggs and spend the whole of their lives.

They never develop wings, and being, like the keds, always on the sheep, they may be exterminated if sufficient trouble be taken.

# THE PREVENTION OF TUBERCULOSIS IN CATTLE.

The possibility of preventing tuberculosis depends upon the fact that it is an infectious disease; and, being Infectious Disease. Tuberculosis an infectious, the steps to be taken are parallel to those taken for the prevention of any other infectious disease, viz., isolation of the infected animals and destruction of the infecting germs.

Until recently tuberculosis was believed to be a hereditary disease—a disease which the offspring of tuberculous parents could rarely escape, and which, if escaped, would re-appear sooner or later in their descendants. The escaping generation, if it did not hand down the disease, handed down the tendency to contract it, and in their descendants this tendency developed into the disease itself! Thus, for the descendants of a tuberculous ancestry, there was little hope. If they escaped the disease, they carried with them the tendency to contract it.

These beliefs are now known to be wrong. An animal can become tuberculous only by infection with the germs of the disease. And not only so: there is no evidence that the offspring of tuberculous ancestors are more liable to the disease than the offspring of those that are sound. Experiments have shown that, by removing them from infection, individuals with a tuberculous ancestry may grow up sound and remain sound, whereas others with a sound ancestry, by being brought in contact with the disease, may become unsound.

To know how to prevent tuberculosis we must know how an animal becomes infected, and how it infects

How the Disease others. There are two main pathways by which the germs of the disease enter the body—the nose and the mouth, with the breath or with the food and drink. The germs are living things, and being alive they must be fed. Their natural food is the live.

and, being alive, they must be fed. Their natural food is the living tissues of a living animal. Once in contact with living tissues the germs endeavour to feed upon them, and, if they succeed, the animal whose tissues are attacked has contracted the disease. The germs multiply quickly at the points they have attacked, and at these places there arises an accumulation of the germs themselves and of the tissues destroyed. From these accumulations,

germs pass on to neighbouring tissues, or are carried sometimes to distant parts of the body. Thus the centres first attacked lead on to others, these to others still, and so on, till in time the majority of the animal's glands and organs may be diseased.

The progress of the disease depends upon the resistance the animal is able to offer to it. This resistance depends upon the animal's inherited strength, and upon fresh air, food, shelter and healthy exercise. In the earlier stages of tuberculosis a vigorous well-nurtured animal may recover; in the later stages its chances are slender indeed. Thus the disease is usually less extensive in young than in old animals. It is also much less common among young than among older animals. The following is an estimate of the number of cattle affected at different ages in the United Kingdom:—Yearlings 5 to 10 per cent.; two-year-olds 10 to 20 per cent.; cows 40 to 60 per cent.

It is unfortunate that, in its earlier stages, tuberculosis is not readily detected. An animal may have had the disease for years before the presence of the disease is discovered, and for some time it may have been spreading the infection. The earlier recognisable symptoms are that the animal ceases to thrive; its coat becomes dry and staring, and loses its oily feeling; the hide is less soft and pliable, and adheres more closely to the body; the eyes look sunken and dull. Later, these symptoms are accentuated, the belly becomes tucked up, and very often the animal has a hard, painful cough, and is unable to endure cold. Other symptoms are swellings about the throat, continued looseness of the bowels, and rises in temperature. Among cows a frequent sign is that they abort, become uncertain, or cease altogether to breed.

It is when the disease is in the lungs or in the udder that an animal is most dangerous to others. When the lungs begin to break down the germs of the disease are scattered with every cough. If the diseased animal is in the house, then the walls, the floor, the feeding trough and other parts near become spattered with infective materials. They are similarly spattered when a throat swelling bursts. These infective materials dry up and a germ-laden dust is raised and tossed about with the very slightest breath of air. Every other animal then living in the same house runs risk of contracting the disease. If there are more animals than one spreading the disease, then the risks to the others are increased. In a byre that has been tuberculous for years, the accumulated risk may become enormous.

In the case of tubercular udder, the risks are to those that drink the milk. A calf reared by its dam takes the whole risk. Calves among

whom the milk from a tubercular udder is divided, divide the risks among them. How many they are that take these risks may be calculated from the basis of one cow in every thirty or forty having a tubercular udder.

How the Disease may be Prevented.

They are separation of the sound from the unsound and disinfection of the infected premises.

The first step is to put not only the obviously unsound but also those that are suspected in quarters by themselves: that is, to isolate them. Unless they are of extraordinary value for breeding purposes they should be fattened for the butcher as soon as possible. By delaying to fatten them the last chance of doing so may be missed. Animals that are beyond all hope of fattening should be cleared out at once.

The udder of every cow should be examined, and if any cow's udder is tubercular her milk should be used no longer. Such milk is dangerous. A tubercular udder is detected first by feeling one or more hard little knots in the soft and flexible interior. As the disease proceeds these knots become larger and larger. The smallest knot is a sufficient warning.

The process of disinfection is simple, and, if well done, effective. The byre or cow-house must first be thoroughly cleared of all food, straw, litter, or manure. The disinfectant to be used is crude carbolic acid. Mix this in hot water in the proportion of one of acid to twenty of water. Stir until the acid is well mixed with the water; then with the hot mixture spray every part of the inside of the building until it is thoroughly saturated. The greatest attention should be given to the feeding troughs and other parts near them which have been most breathed or coughed upon; but no part of the building-floors, walls, eaves, crevices, even the wood of the roof-should be omitted. The mixture can be sprayed with an ordinary garden syringe or with a spraying machine. The quantity required is about one gallon of the acid to every ten head of cattle, that is two gallons of the mixture to every head; but the first time a place is disinfected it would be wise to use more. The disinfecting should be done once every year at least; preferably in summer when the cattle are on the pastures and the byres are empty. All doors and windows should be kept closed for eight or ten hours after the byre or cow-house has been sprayed. If an animal shows signs of tuberculosis during the winter and has to be removed. the part of the byre it stood in should be disinfected before another fills its place.

The man who is using the sprayer or syringe should keep his hands and arms well smeared with oil during the process.

The farmer who follows the above directions faithfully may reason ably hope to have his whole herd entirely sound in a few years; but his success will depend upon his keenness in singling out and isolating suspected animals, and in the thoroughness with which his premises are disinfected. It will also depend upon the care he exercises in introducing new animals, more especially cows, to his herd. If he is bound to buy in strange stock, he should treat them as suspects until he is assured they are sound.

If a farmer is unable to have the sound and the unsound in separate houses, then he can at least have them in separate ends of the same house, with as much space between them as possible. In such a case, however, the disinfection must be done oftener than once a year, and the unsound must be got rid of with the very shortest delay. But the same success cannot be looked for as with complete isolation.

But disinfection and isolation must never become an excuse for neglecting the remedies provided by nature, which are sunlight, fresh air, and exercise. With regard to light and air, the byre should be as like as possible to the open field, and every animal should have frequent exercise.

There are two aspects of this problem that have not been considered,

The Use of Tuber-

viz.: the use of tuberculin, and breeding from tuberculous cows. The advantage of the use of tuberculin is that it discovers a tuberculous animal even in the early stages of the disease,

long before it could be discovered by the eye, and long before it could become a danger to others. Thus, by using tuberculin and getting an earlier isolation of the diseased, the total elimination of disease from a herd may be hastened. The cost in this case is the veterinary surgeon's fee, and about 6d. a head for tuberculin. In the end it may be the cheaper method. The result is likely also to be more certain since the farmer knows definitely whether every animal in his possession is sound or unsound.

Breeding from obviously tuberculous cows is not to be recommended in the case of ordinary commercial stock. It can Breeding from Tuber. be recommended only when the value of the culous Cows.

young is expected to be so great that the risk is worth while. If a cow is rearing a calf, the cow should be near the calf only at suckling time; and the greatest

care should be taken that the calf gets plenty of fresh air and exercise, and that the disinfection of both the cow-house and the calf-house is complete. This cow must be constantly examined for tubercular udder. The risk of a calf from a tuberculous cow contracting tuberculosis may be reduced to a minimum if it be fed upon the milk of another cow which is free from the disease.

There is one very common assumption about tuberculosis that must be guarded against, viz., that if the farmer has never noticed a "piner" or even a suspicious animal among his stock, his stock is entirely sound, and that therefore, in his case, there is no need for disinfection. It may be taken for granted that every farm has the disease, and that every farm needs disinfection. If a farmer is fortunate enough to have a stock that is not tuberculous, the disinfecting of his premises will not be in vain. It will help to prevent other infectious diseases, such as abortion and calf mortality.

JAMES WILSON.

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# THE INTERNATIONAL VETERINARY CONGRESS AT BUDAPEST.

The Eighth International Veterinary Congress held its session at Budapest, from the 3rd to the 9th September, 1905. Delegates attended, not only from all the chief European States, but also from China, Japan, America, and South Africa. Seven delegates represented the United Kingdom. Prof. A. E. Mettam, B.Sc., M.R.C.V.S., Principal of the Royal Veterinary College for Ireland, who represented the Department of Agriculture and Technical Instruction for Ireland, was amongst this number and the following extracts are taken from his report.

Besides highly important questions of Veterinary Police, which mainly occupied the attention of former Congresses, the meeting dealt with questions relating to Biology, Hygiene, and Pathology, and special sections were constituted for the consideration of these matters.

The papers presented to the Congress upon "Protective Inoculation against Cattle Tuberculosis" were of Inoculation against great interest, but it still remains to be seen what practical value the method has.

The Protective Inoculation consists in

giving young bovines injections of human bacilli of tuberculosis of low virulence. It is said that the animals withstand infection, and that after the lapse of some months they are able to receive, without any ill effects, injections of virulent bovine bacilli. Numbers of young cattle have received the injections, not only in Germany but also in the United States, and the experimenters are enthusiastic as to their results. The new method recommended for creating herds immune to tuberculosis is, however, a tedious one, and as yet in the experimental stage, and there is, no doubt, wisdom in Bany's advice that his own method, at any rate for some time to come, is of more practical utility.

Bany presented a paper to the Congress giving more and later information as to his method of freeing a herd from tuberculosis and keeping it free from the disease, and another writer upon the subject of "Suppression of Tuberculosis among the Domestic Animals," detailed his experience of the Bany method under somewhat adverse circumstances in Hungary. The method originally formulated by Bany, whose original paper, it is interesting to note, was read at "The International Congress of

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Hygiene" in Budapest in 1894, is briefly as follows: -All the members of the herd are to be tested with tuberculin, and the reactors are to be separated from, and kept separate from the non-reactors. The reactors are to be got rid of as soon as convenient by feeding for the butcher, or otherwise—as slaughter and destruction. Animals born of the reactors are to be removed at once, fed upon the milk of the dam only after it has been heated to 80°C.(=176°F.). These young animals are to be kept by themselves and periodically tested with tuberculin; if they do not react they may be utilised as the founders of the new tubercle-free herd. The non-reactors, or healthy members of the herd, are also periodically tested with tuberculin, and any reacting animals are removed, fattened, and got rid of. In this way those animals that are tuberculous are cleared out of the herd; the periodic testing controls the condition of the herd; and vacancies in the herd are filled by young animals bred upon the farm that are tubercle-free. Following these lines it is possible in, relatively, a short space of time to have a herd of cattle free from tuberculosis. in the herd which are particularly dangerous are those known as piners, i.e., those suffering from pulmonary tuberculosis with wasting, those suffering from tuberculosis of the udder, and those affected with tuberculosis of the uterus. Such animals should be slaughtered forthwith and in Bany's opinion the State should give compensation. The reason why animals suffering from these types or forms of tuberculosis are to be destroyed at once is that they are the disseminators of the tuberculous virus, and the source of danger to healthy stock; consequently the removal of the clinically tubercular is of especial importance in attempting to free a herd from the dreaded scourge. Bany, in his paper, expressed the opinion that the method he recommended, and which had proved so successful not only in Denmark but elsewhere, was of more practical utility at the present stage than any alternative method, and his opinion seemed to be that of the majority of the delegates.

An important question studied in the Pathological Section was
the "Relations between the Tuberculosis of
Tuberculosis in Man and of Cattle, Poultry, and other
Man and in the
lower Animals. Domestic Animals (especially Dogs)." It
may be remembered that at the Congress of
Tuberculosis, held in London in 1901, Pro-

fessor Koch, in collaboration with Professor Schütz, of the Berlin Veterinary School, declared that human tubercle bacilli were not

pathogenic to cattle, and inferred that the converse held good. He refused to recognise any danger to man from tuberculous meat and milk.

"I feel justified in maintaining that human tuberculosis differs from bovine, and cannot be transmitted to cattle. It is well known that the milk and butter consumed in great cities very often contain large quantities of the bacilli of bovine tuberculosis in a living condition, as the numerous infection-experiments with such dairy products on animals have proved. Most of the inhabitants of such cities daily consume such living and perfectly virulent bacilli of bovine tuberculosis, and unintentionally carry out the experiment which we are not at liberty to make. If the bacilli of bovine tuberculosis were able to infect human beings, many cases of tuberculosis caused by the consumption of alimenta containing tubercle-bacilli could not but occur among the inhabitants of great cities, especially children. And most medical men believe that this is actually the case. In reality, however, it is not so "

There is no necessity to traverse the ground already so thoroughly explored since the day of this pronouncement. Most medical men and veterinary surgeons believe that though human and bovine bacilli of tuberculosis may not agree in virulence for cattle, there are undoubted cases where children have been infected with bacilli of tuberculosis of undoubted bovine origin, and on the other hand virulent bacilli have been isolated from children that have produced in cattle all the lesions of bovine tuberculosis. In view of the enormous experience members of the profession have of tuberculosis, as found in all domestic animals save the sheep and goat, it was well to obtain their opinion upon this question of infectivity. The Congress at Budapest had little hesitation in coming to a decision, despite the fact that Professors Schütz and Löeffler were present to champion Koch's doctrine. The following resolution was adopted:—

"The Congress, having heard the discussion on the question of the relationship between human and animal tuberculosis, records the opinion that it is right to continue to take measures to prevent the transmission of tuberculosis from animals to man."

It is thus clear that the Congress believes that tuberculosis in the lower animals is a distinct menace to man, and that precautions should be taken accordingly.

Other important papers upon tuberculosis were considered, as
those having the title "On the manner of
How Infection is Infection in Tuberculosis of Domestic
Conveyed. Animals." Tuberculosis is due to the
entrance into the animal body of a minute
bacterium, which doubtfully may live for sometime outside the

bodies of animals. If we exclude the less common routes of

entrance of the organism into the body-wounds, the sexual organs, the eye and the udder-we come to consider the respiratory tract and the alimentary canal. The respiratory passages are possibly common entrances for the bacilli in animals that are crowded together in badly-ventilated houses, where animals are made to breathe air that may be contaminated with the bacilli, suspended in small particles of moisture, coughed up by tuberculous patients. Lesions more or less disseminated through the lungs are set up by the bacilli gaining entrance to the tissues from the mucous membrane where they come to lodge; or the lesions become scattered through the lungs owing to the virus reaching the vessels by the lymph route. Though infection by the inspired air cannot be neglected, the most probable route of infection is through the alimentary tract, and this applies to all the domestic animals. Infection occurs through the alimentary canal by means of food-milk especially. Von Behring believes the alimentary tract peculiarly vulnerable in young animals, because of the incompleteness of the epithelial lining. Certain it is that many primary, and also secondary, infections occur through the intestine. Possibly it is the only route of infection in poultry; it is the most common in calves and young pigs, and doubtless in horses. dogs, according to the writer's experience, it is at any rate as common as by the respiratory tract. Infection occurring through the gut soon involves the lymphatic glands and vessels and spreads thence to far distant organs by the blood stream. This is the reason why feeding upon contaminated food stuff, milk, milk refuse, offal, etc., is so prolific in producing tuberculosis, and hence the reason why milk, etc., should be heated to at least 80°C., as Bany recommends, before it is given to young stock. crowding favours the development of pulmonary tuberculosis by the breathing of an atmosphere containing the germ of tuberculosis and feeding on material that contains the infective agent produces tuberculosis by the intestinal route, then it is perfectly obvious how tuberculosis may be prevented in the vast majority of cases. That being so, we have only to look after the housing and feeding of young stock to practically eradicate the disease. It must not be forgotten, however, that diseased organs and their secretions spread the disease, and so animals with diseased udders, diseased wombs, and animals that are voiding virulent material in the dung and urine are quite as dangerous as animals with tuberculosis of the lungs confined in houses with others apparently in health.

A very important section was that in which Tropical Diseases was discussed. In recent years many new facts

Tropical Diseases. have been demonstrated as to the cause of diseases which not only decimate the white man, but diseases which annihilate his herds.

Everyone is familiar with the cause of malaria and the connection between the cause and the mosquito, and now knows that an attack upon and destruction of the mosquito will render a place habitable for man. The bite of an infected mosquito is followed in man by an attack of malaria, and the development in the red blood corpuscles of an animal parasite which passes a portion of its life cycle in the corpuscles. If a man when suffering from malaria is bitten by a mosquito which sucks his blood, then the mosquito, taking into its stomach infected blood, allows the parasite to complete its life cycle in its own body. If again the mosquito bites a healthy person, the latter becomes infected, and so the disease spreads and is continued from season to season and year to year. Destruction of the mosquito either directly or by attending to the pools where it breeds, is followed by rapid disappearance of malaria from the district. Somewhat on similar lines many diseases of tropical climes affecting horses, cattle, sheep, goats and dogs, are conveyed from animal to animal, and it has also been shown that certain diseases in fowls and geese are spread in the same way. In temperate climes we also know of serious diseases such as red water in cattle that are conveyed to suitable "hosts" by the bites of ticks. The interest, then, to us of the subjects discussed in the section was profound, as without going so far as the Tropics, we have at least one disease at home disseminated by an insect.\*

Besides papers relating chiefly to problems of veterinary medicine other papers of a more general character were read and discussed. Thus much attention was devoted to such subjects as the feeding of animals, the different values of food-stuffs, the use of various kinds of litters, and the importance of live stock insurance.

<sup>•</sup> See the Article by Professor Mettam, on "Red Water in Cattle," at page 248.

## OFFICIAL DOCUMENTS.

#### I.—ADMINISTRATIVE.

DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

Regulations under section twenty-four of the Agriculture and Technical Instruction (Ireland) Act, 1899.

REGULATIONS FOR THE APPOINTMENT OF MEMBERS OF THE COUNCIL OF AGRICULTURE, THE AGRICULTURAL BOARD, AND THE BOARD OF TECHNICAL INSTRUCTION.

BY THE DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

WHEREAS it is enacted by section twenty-four of the Agriculture and Technical Instruction (Ireland) Act, 1899, that the Department may make general regulations for regulating the proceedings for the appointment of the members of the Council and of each Board established by the Act, and that the appointing body

shall act in accordance with those regulations:

And whereas by section two of the Rules Publication Act, 1893, it is provided that where a rule-making authority certifies that on account of urgency or any special reason any rule should come into immediate operation it should be lawful for such authority to make any such rules to come into operation forthwith as provisional rules, but such provisional rules should only continue in force until rules should have been made in accordance with the foregoing provisions of the said Act of 1893:

Now we, the said Department, by virtue of the powers vested in us for that purpose as aforesaid, and of all other powers enabling us in that behalf, do hereby make the following regulations:—

1.—(1.) The Interpretation Act, 1889, applies for the purpose of the interpretation of these regulations as it applies for the interpretation of an Act of Parliament.

(2.) In these regulations, unless the context otherwise requires, the expression "the Act" means the Agriculture and Technical Instruction (Ireland) Act, 1899; and other expressions have the same meaning as in the Act, and the expression "the secretary" means in the case of the council of an urban district "the clerk."

2.—The council of a county (other than a county borough) shall, at any meeting held between the first of January and the first of

April in any year in which the tenure of office of the Council of Agriculture expires, appoint persons to be members of the Council of Agriculture in accordance with the provisions of section eight of

- 3.—The first meeting of the new Council of Agriculture shall be held at such time and place as may be appointed by the Department, and immediately after the transaction of such business as may be brought before the Council by the Department the several provincial committees shall sit separately and shall appoint persons to be members of the Agricultural Board and the Board of Technical Instruction, in accordance with the provisions of sections nine and ten of the Act.
- 4.—(1.) The council of each county borough shall at any meeting held between the first of January and the first of April in any year in which the tenure of office of the Board of Technical Instruction expires, appoint persons to be members of the Board of Technical Instruction, in accordance with the provisions of section ten of the  $\mathbf{Act}.$
- (2.) Each of the councils of the urban county districts in the county of Dublin shall at any meeting held between the first of January and the first of April in any year in which the tenure of office of the Board of Technical Instruction expires, choose out of their body one person to be a member of the joint committee for appointing a member of the Board of Technical Instruction.

(3.) The said joint committee shall meet on such a day, at such an hour and at such a place as the Department may direct, and shall appoint one person to be a member of the Board of Technical Instruction.

- (4.) The Commissioners of National Education shall at any meeting held between the first of January and the first of April in any year in which the tenure of office of the Board of Technical Instruction expires, appoint one person to be a member of the Board of Technical Instruction and one person to be a member of the Consultative Committee of Education established by section twenty-three of the Act.
- (5.) The Intermediate Education Board shall at any meeting held between the first of January and the first of April in any year in which the tenure of office of the Board of Technical Instruction expires, appoint one person to be a member of the Board of Technical Instruction and one person to be a member of the Consultative Committee of Education.
- 5. If any person is appointed a member of the Council, or of either Board established by the Act, by more than one appointing body, he shall forthwith deliver or transmit by post to the secretary of the Department, a notice specifying the body which he elects to represent on such Council or Board, and any appointing body which he does not elect to so represent shall, as soon as may be, make a new appointment.
- Every person appointed a member of the council or of either Board established by the Act who is willing to accept the office shall within one week after the date of his appointment deliver or transmit by post to the secretary of the Department a statement to that effect signed by him, and if any such person fails to comply with

this requirement a casual vacancy shall be deemed to have occurred in the office to which he was appointed: Provided that the said period of one week may in special cases be extended by the Department.

7.—If a casual vacancy occurs in the office of member of the Council or of either Board established by the Act, the body by whom the person whose office is vacant was appointed, shall, as soon

as may be, fill the vacancy.

8.—The secretary, or in the case of a committee the chairman, of each appointing body mentioned in sections eight, nine, and ten of the Act shall as soon as may be deliver or transmit by post to the Department the names and addresses of the persons appointed by the body of which he is secretary or chairman.

9.—(1.) The first business at any meeting of a provincial committee or of the joint committee of the urban county districts shall

be to elect a chairman who shall hold office for that meeting.

(2.) The appointment of members of the Agricultural Board or the Board of Technical Instruction by any such committee shall be decided by a majority of votes of the members present and voting on the question. If more than two persons are proposed and seconded for a vacancy, the method of election to be followed shall be that of successive polls, the person polling the fewest votes on each occasion dropping out until one candidate has a clear majority of the votes of the members present and voting.

(3.) In case of an equal division of votes the chairman of the

committee shall have a second or casting vote.

- (4.) The quorum of every such committee shall be one-half of the whole number of the committee, except in the case-of the provincial committees of Ulster and Connaught, where the quorums shall be thirteen and seven respectively. Where, however, a meeting of the committee is held for the purpose of filling a casual vacancy the quorum shall be one-third of the whole number of the committee.
- (5.) The proceedings of any such committee shall not be invalidated by any vacancy among their numbers of by the presence of any member whose appointment may be subsequently declared by the Department to be invalid.
- (6.) If a casual vacancy occurs in any such committee the Department shall notify the secretary of the proper appointing body, and the vacancy shall be filled as soon as may be after such notification.
- (7.) If a casual vacancy requiring to be filled by any such committee occurs in the office of member of either Board established by the Act, the Department shall call a meeting thereof to be held at such time and place as may be appointed by the Department.
- 10.—Any question which may arise as to the validity of any appointment made in pursuance of these regulations shall be rereferred to the Department, whose decision shall be final.
- 11.—The secretary of each appointing body mentioned in sections eight, nine, and ten of the Act shall forthwith upon the receipt by him from the Department of copies of these regulations deliver or transmit by post a copy thereof to each member of the body of which he is secretary.

We do hereby certify that on account of urgency the above regulations shall on the date hereof come into immediate operation, and do make the said regulations to come into operation on the said date as provisional regulations, and to continue in force until regulations have been made in accordance with the provisions in that behalf in the Rules Publication Act, 1893.

Sealed with our seal this second day of December, in the year of our Lord one thousand nine hundred and five.

(Signed)

WALTER H. LONG. HORACE PLUNKETT.

[SEAL.]

T. P. GILL,

Secretary.

DEPARTMENT OF AGRICULTURE,

AND TECHNICAL INSTRUCTION FOR IRELAND,

UPPER MERRION STREET, DUBLIN,

15th December, 1905.

#### COUNCIL OF AGRICULTURE.

Sir,

I have to acquaint you, for the information of your Council, that the term of office of the present Council of Agriculture will expire on the 31st March, 1906, and to enclose a copy of the regulations for the apointment of members of the new Council.

The regulations immediately concerning your Council are Nos. 2, 5, 6, 8, and 11, which provide for the appointment of two persons, who need not necessarily be members of your Council, to serve on the Council of Agriculture, in accordance with Section 8 of the Agriculture and Technical Instruction (Ireland) Act, 1899.

It will be observed that under the regulations now issued the appointment of representatives by the County Council may take place at any meeting of the County Council held between 1st January and 1st April 1906. This arrangement has been made in order to obviate the inconvenience of a special meeting of the County Council for the purpose of the election. The new representatives will, of course, not assume office until 1st April, 1906.

By Section 27 (1) of the Act of 1899, the members of the Council of Agriculture hold office for terms of three years, and may be re-appointed.

A supply of copies of the regulations is sent under separate cover to enable you to comply with the provisions of Regulation No. 11.

Further copies may be had on application.

I am to request that, in consultation with the Chairman, you will have the necessary formal notice given on the Agenda paper for the meeting at which the appointments in question will be made; and I am also to ask you to inform the Department in due course of the date of that meeting.

I am,

Sir,

Your obedient Servant,

T. P. GILL,

Secretary.

The Secretary,

-County Council.

#### II.—AGRICULTURAL.

A 55.

## SCHEME OF PRIZES FOR COTTAGES AND SMALL FARMS, 1906.

- 1. In 1906 County Committees of Agriculture may, subject to the Department's approval, offer prizes in one or both of the following sections, subject to the provisions of this scheme, viz.:—
  - A. Cottages with gardens;
  - B. Small farms.
- 2. Competition in Section A shall be confined to bond fide cottagers.

Only bond fide farmers who derive their means of living mainly from farming, who reside on their farms and work the farms themselves, will be eligible to compete in Section B. At least one-fourth of the arable land of the entire holding of each competitor in this section must be tillage, first year's grass or meadow being regarded as tillage.

- 3. For the purposes of this scheme the county may be divided into districts or circuits, in each of which separate competitions will be held.
- 4. Particulars as to the sections adopted, the number of districts or circuits into which the county is divided, the number of classes in each section, the limits of valuation or acreage fixed by the County Committee for each class, and the number and value of the prizes offered, must be submitted to the Department on the prescribed form for approval.

5. Entries must be made on special forms to be obtained from the Secretary of the County Committee. Each competitor must forward one of these forms, accurately filled up in every detail, so as to reach the Secretary of the County Committee on or before a date to be fixed by the County Committee, but in no case later than the 31st May, 1906.

6. In cases of insufficient competition, want of merit, or in which the conditions of this scheme have not been strictly ad-

hered to, the prizes may be withheld in whole or in part.

7. The following points shall be taken into consideration by the judge in making his awards:—

#### COTTAGE SECTION.

- (a.) Cleanliness and general order of cottages and premises.
- (b.) Cultivation of the garden, varieties of fruit and vegetables, arrangement of manure heap.
- (c.) General management and care of live stock (if any), poultry (quality to be particularly considered), housing accommodation, &c.

#### SMALL FARM SECTION.

(a.) Cleanliness, order and economy in the dwelling-houses and

offices (including poultry-houses).

- (b.) Judicious character of cropping, efficiency of cultivation, arrangement of manure heaps, and provision for collecting liquid manure.
- (c.) Cultivation of the garden, variety of vegetables and fruit trees.
- (d.) General condition of land under grass, care of fences, gates, water courses, &c.
- (e.) Freedom from weeds, especially grass land; stack-yards and headlands.
- (f.) Cultivation of headlands.
- (y.) Management and care of live stock and poultry (quality to be particularly considered).
- 8. Special credit will be given if simple accounts of receipt and expenditure in connection with any holding entered for competition are kept and exhibited to the judge.

9. The Department will supply, free of charge to the county, the

services of an Instructor to act as judge under this scheme.

10. The judge's report shall deal with such matters in connection with the competition as the Department and the County Committee may decide.

11. The inspection of cottages or small holdings entered for competition under this scheme will be made between the months of

June and August.

12. The Committee shall submit the judge's report, with list of awards, for consideration by the Department, who, as soon as they are satisfied as to the fulfilment of the conditions of this scheme, will notify the Secretary of the County Committee that

the prizes or reduced prizes may be paid. The awards will not be final until the sanction of the Department has been conveyed in writing to the Secretary.

- 13. The County Committee shall furnish to the Department such detailed statements of expenditure under this scheme as may be required from time to time.
- 14. In all matters of dispute relating to this scheme the decision of the Department shall be final.

## DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

#### SCHEME OF EXPERIMENTS FOR 1906

These experiments are intended only for those counties in which an agricultural instructor has been appointed for the purpose of personally attending to all the details of selecting and measuring the land, sowing the seed, applying the manure, weighing the crops, and tabulating and writing a report on the result.

Agricultural instructors, before arranging the centres for these experiments, should carefully study the appendix to this scheme. They should be specially careful not to undertake experiments at too many centres, as the amount of work necessary is much greater than is supposed by those who have no experience of field experiments. Demonstrations with seeds and manures may be undertaken at a much larger number of centres.

Before commencing field experiments and demonstrations, each instructor must submit to the Department his proposals for the year.

In all cases seeds and manures must be ordered by the instructor,

and paid for by the County Committee.

As early as possible, after the close of the season, tabulated results of the experiments must be sent to the Department, and where these are presented in a concise form, accompanied by brief and carefully prepared notes, the same may be published by the County Committee, provided the approval of the Department has been previously obtained. All plots should be marked off at the commencement of the experiment by pegs, 3 inches square and  $2\frac{1}{2}$  feet long, which should be firmly driven into the ground.

No change must be made in any of the manurial experiments, as given below, but the instructor may include such additional plots as local conditions render advisable. In the variety tests instructors are strongly advised not to omit any variety unless it is

found impossible to procure the proper seed.

It is not absolutely necessary to have both a manurial and a variety test with any particular crop. One or other, or both, may be omitted at discretion.

#### SCHEME OF THE EXPERIMENTS.

I .- OAT CROP (Manurial Test).

Size of plots, one-tenth of a statute acre.

The following kinds and quantities of manure will be used per statute acre: --

No. of Plot.

- 1. No manure.
- 2. 1 cwt. Sulphate of Ammonia.
- 3. 3 cwts. Superphosphate.
- 1 cwt. Sulphate of Ammonia.

3 cwts. Superphosphate.

5. { 1 cwt. Sulphate of Ammonia. 3 cwts. Superphosphate. 3 cwts. Kainit.

## II .- OAT CROP (Variety Test).

Size of plots, one-tenth of a statute acre.

The following varieties may be tested: -

No. of Plot.

- 1. Potato.
- 2. Black Tartarian.
- 3. Abundance.
- 4. Waverlev.
- 5. Tartar King.
- 6. Banner.
- 7. Island Magee.
- 8. Any other variety.

## III.—BARLEY CROP (Manurial Test).

Size of plots, one-tenth of a statute acre.

The kinds and quantities of manure will be the same as for Oats (see above).

## IV .- BARLEY CROP (Variety Test).

Size of plots, one-tenth of a statute acre.

The following varieties may be tested:—

No. of Plot.

- 1. Archer's Chevalier.
- 2. Scotch Chevalier.
- 3. Hallet's Pedigree.
- 4. Garton's Brewers' Favourite.
- 5. Garton's Invincible.

## V .- TURNIP CROP (Manurial Test with Farmyard Manure).

Size of plots, one-twentieth of a statute acre.

The following kinds and quantities of manures will be used per statute acre:—

#### No. of Plot.

- 1. No manure (size of this plot, one-fortieth of a statute acre).
- 2. 20 tons farmyard manure.
- 3. 10 tons farmyard manure.
- 4. { 10 tons farmyard manure. 4 cwt. Superphosphate.
- 5. \begin{cases} 10 tons farmyard manure. \\ 4 cwt. Superphosphate. \\ 1 cwt. Sulphate of Ammonia.
- 6. 10 tons farmyard manure.
  4 cwt. Superphosphate.
  1 cwt. Sulphate of Ammonia.
  3 cwt. Kainit.
- 10 tons farmyard manure.
  4 cwt. Superphosphate.
  7. 1 cwt. Sulphate of Ammonia.
  3 cwt. Sulphate of Potash (not less than 90 per cent.,

## VI .- TURNIP CROP (Manurial test without Farmyard Manure).

Size of plots, one-twentieth of a statute acre.

The following kinds and quantities of manures will be used per statute acre:—

#### No. of Plot.

- 1. No manure (size of this plot, one-fortieth of a statute acre).
- 2. 4 cwt. Superphosphate.
- 3. { 4 cwt. Superphosphate. 1 cwt. Sulphate of Ammonia.
- 4. 
  4 cwt. Superphosphate.
  1 cwt. Sulphate of Ammonia.
  3 cwt. Kainit.
- 5.  $\begin{cases} 6 \text{ cwt. Superphosphate.} \\ 1\frac{1}{2} \text{ cwt. Sulphate of Ammonia.} \\ 4\frac{1}{2} \text{ cwt. Kainit.} \end{cases}$

## VII.—TURNIP CROP (Variety Test).

Size of plots, each four ridges full length of field.

The following varieties may be tested:-

1. Stirling Castle. 8. Bronze Top.	No. of Plot.	No. of Plot.
0 T 1 T 1 F 1 F 1	1. Stirling Castle.	8. Bronze Top.
2. Improved Purple Top. 9. Monarch.	2. Improved Purple Top.	9. Monarch.
3. Elephant. 10. Aberdeen Green Top	3. Elephant.	10. Aberdeen Green Top.
4. Kangaroo. 11. Centenary.	4. Kangaroo.	11. Centenary.
5. Best of All. 12. Fosterton Hybrid.	5. Best of All.	12. Fosterton Hybrid.
6. Magnum Bonum. 13. Aberdeen Purple To	6. Magnum Bonum.	13. Aberdeen Purple Top.
7. Triumph. 14. Any other variety.	7. Triumph.	14. Any other variety.

Note.—Nos. 1 to 9, inclusive, are Swedes.

## VIII. MANGEL CROP (Manurial Test).

Size of plots, one-twentieth of a statute acre.

The following kinds and quantities of manures will be used per statute acre:

No. of Plot.

- 1. No manure (size of this plot, one-fortieth of a statute acre).
- 2. 20 tons farmyard manure.
- 3. \ 20 tons farmyard manure. 4 cwt. Superphosphate.
- 4. 20 tons farmyard manure. 4 cwt. Superphosphate. 2 cwt. Sulphate of Ammonia.
- 20 tons farmyard manure.4 cwt. Superphosphate.2 cwt. Sulphate of Ammonia.4 cwt. Kainit.
- 1 20 tons farmyard manure.
- 4 cwt. Superphosphate.
  2 cwt. Sulphate of Ammonia.
  4 cwt. Salt.

  - 20 tons farmyard manure.

  - 4 cwt. Superphosphate.
    4 cwt. Salt.
    2 cwt. Nitrate of Soda (to be applied after thinning in two dressings).

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### IX .- MANGEL CROP (Variety Test).

Size of plots, each four ridges full length of field.

The following varieties may be tested:—

No. of Plot.

- 1. Yellow Globe.
- 2. Prize Winner.
- 3. Crimson Tankard.
- 4. Golden Tankard.
- Long Red.
- Windsor Prize Taker.
- 7. New Triumph.
- Golden Globe.
- Any other variety.

### X.—Potato Crop (Manurial Test).

Size of plots, one-twentieth of a statute acre.

The following kinds and quantities of manures will be used per statute acre:-

No. of Plot.

- 1. No manure (size of this plot, one-fortieth of a statute acre).
- 2. 20 tons farmyard manure.
- 3. 15 tons farmyard manure.
- 4. \( 15 \tons \text{farmyard manure.} \)
  - 1 cwt. Sulphate of Ammonia.
  - 15 tons farmyard manure.
- 1 cwt. Sulphate of Ammonia.
  - 4 cwt. Superphosphate.
  - 15 tons farmyard manure. 1 cwt. Sulphate of Ammonia.
- 4 cwt. Superphosphate.
  - 1 cwt. Muriate of Potash (high grade).
  - 15 tons farmyard manure.
- 1 cwt. Sulphate of Ammonia.
  - 4 cwt. Superphosphate.
  - 1 cwt. Sulphate of Potash (high grade).

## XI.—POTATO CROP (Variety Test).

Size of plots, one-twentieth of a statute acre.

The following varieties may be tested:-

Maincrop.

Mid-Season.

No. of Plot.

- Langworthy.
- 2. Black Skerries.
- 3. Champion II.
- 4. Old Champion.
- 5. Beauty of Bute.
- 6. Up-to-Date.
- 7. Evergood.
- 8. Discovery.
- 9. Northern Star.
- Any other variety.

No. of Plot.

11. British Queen.

12. Royal Kidney.

13. Any other variety.

#### XII.—POTATO CROP (Boxing Test).

Size of plots, one-twentieth of a statute acre.

No. of Plot.

- 1. Seed boxed before December 1st.
- 2. Seed boxed after January 31st.
- Unsprouted seed.

XIII.—POTATO CROP (Spraying Test).

Size of plots, one-tenth of a statute acre.

The following will be compared: -

No. of Plot.

1. Unsprayed.

- 2. Effect of a 2 per cent. lime or Bordeaux mixture, single application.
- 3. Effect of a 2 per cent. lime or Bordeaux mixture, double application.

4. Effect of a 3 per cent. lime or Bordeaux mixture.

- 5. Effect of a 2 per cent. soda or Burgundy mixture, single application.
- 6. Effect of a 2 per cent. soda or Burgundy mixture, double application.
- 7. Effect of a 3 per cent. soda or Burgundy mixture.

### XIV .- DESTRUCTION OF CHARLOCK (PRESHAUGH) AND OTHER WEEDS (Spraying Test).

Size of plots, one-tenth of a statute acre.

The following solutions will be tested:—

No. of

1. Unsprayed.

- 2. 50 gallons 3 per cent. Sulphate of Copper.
- 3. 50 gallons 4 per cent. Sulphate of Copper.
- 4. 50 gallons 10 per cent. Sulphate of Iron:
- 5. 50 gallons 15 per cent. Sulphate of Iron. XV.—MEADOW HAY CROP (Manurial Test for one year).

Size of plots, one-twentieth of a statute acre.

The following kinds and quantities of manures will be used per statute acre:--

- No. of Plot. 1. No manure.
- 2. 10 tons farmyard manure.
- 3. 1 cwt. Nitrate of Soda.
- 1 cwt. Nitrate of Soda.
- 2 cwt. Superphosphate.
  - 1 cwt. Nitrate of Soda. 2 cwt. Superphosphate.
  - 2 cwt. Kainit.
  - 1 cwt. Nitrate of Soda.
- 2 cwt. Superphosphate. 2 cwt. Kainit (applied not later than Nov. 30th).

#### XVI.-IMPROVEMENT OF SECOND CLASS PASTURE.

Improvement to be estimated by Observation.

Size of Plots, one-half a statute acre.

The following plan is suggested:-

#### No. of Plot.

- 1. 5 cwt. Basic Slag per statute acre.
- 2. 10 cwt. Basic Slag per statute acre.
- 3. Unmanured.

#### XVII.—INFLUENCE OF SEED MIXTURES IN FORMING PASTURE.

Land selected to be left in grass for not less than two years.

Size of plots, one-tenth of a statute acre.

The following mixtures may be tested:—

#### Plot 1.

- 1½ bushels Italian Rye Grass (22 lbs. the bushel).
  - ½ bushel Perennial Rye Grass (28 lbs. the bushel).
  - 4 lbs. Red Clover.
  - 2 lbs. White Clover.

#### Plot 2.

- 1 bushel Perennial Rye Grass (28 lbs. the bushel).
- ½ bushel Italian Rye Grass (22 lbs. the bushel).
- 4 lbs. Red Clover.
- 2 lbs. White Clover.

#### Plot 3.

- 1 bushel Meadow Fescue (28 lbs. the bushel).
- ½ bushel Italian Rye Grass (22 lbs. the bushel).
- 4 lbs. Red Clover.
- 2 lbs. White Clover.

#### Plot 4.

- ½ bushel Perennial Rye Grass (28lbs. the bushel).
- bushel Italian Rye Grass (22 lbs. the bushel).
- 3 lbs. Cocksfoot.
- 3 lbs. Timothy.
- 3 lbs. Meadow Fescue.
- 3 lbs. Red Clover.
- 2 lbs. Alsike Clover.
- 2 lbs. White Clover.

FORM A 168 (a).

## DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

#### AVONDALE POULTRY FATTENING STATION.

The Department have established a station at Avondale, Rathdrum, County Wicklow, for the purpose of training young men who desire to acquire a practical knowledge of the breeding and fattening of poultry, with a view to undertaking the management of Fattening Stations in other parts of the country. Apprenticeship may extend over a period of from six to twelve months, according to the industry and efficiency of the apprentice.

The apprentices will be under the direction of the Superintendent, who will instruct them in the best methods of rearing and fattening fowl. They will be required to engage daily in the practical work of the Station from 7 a.m. to 6 p.m., with an interval of one hour for dinner, and may be required to attend classes relating to the industry

in the evenings.

Applicants for apprenticeship must be at least 20 years of age, in good health and of strong constitution. Preference will be given to those who have had experience in poultry-keeping.

Admission as an apprentice is conditional on passing the entrance examination in English and Arithmetic, which will be held in Dublin on the 30th January, 1906. No expenses will be allowed to candidates in connection with their attendance at this examination.

Applications for admission to the entrance examination must be made on forms provided for the purpose, which can be obtained from

THE SECRETARY,

## DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION,

DUBLIN.

These forms must be returned to the offices of the Department not later than the 25th January, 1906.

Successful candidates will be admitted as vacancies occur. They will receive wages at the rate of 16s. per week from the date of their commencing work at the Station. The engagement between apprentices and the Department may be determined at any time by one week's notice on either side.

Apprentices will be required to find their own board and lodging, but the Superintendent will assist them by supplying the names of persons who have suitable accommodation in the neighbourhood of the Station.

It should be understood that the Department do not undertake to employ or procure employment for apprentices on conclusion of their training.

Last date for receiving applications, 25th January, 1906.

December, 1905.

## DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

## INSTRUCTION IN FRUIT-GROWING AND GENERAL GARDENING.

The Department have at present a few vacancies in their Horticultural School at the Albert Agricultural College, Glasnevin. Applicants must be prepared to undergo an examination to be held at the Albert Agricultural College on a date to be subsequently notified. No allowance for expenses will be made to candidates in respect of attendance at this examination.

The examination will include English, Arithmetic, and Practical Fruit-growing and Gardening. The examination in English will include Dictation, Grammar, and Composition, and that in Arithmetic a knowledge of weights and measures, decimal and vulgar fractions, simple and compound proportions, percentages and interest. The examination in Practical Fruit-growing and Gardening will cover the whole range of these subjects.

The course is suited for those who have already had some experience in fruit-growing, and for such a training of from one to two years should suffice to qualify for the post of Instructor in Horticulture. The Department do not guarantee employment to the pupils at the close of the course, but they will send the names of those who qualify to County Committees of Agriculture and Technical Instruction, with an intimation that the Department will approve of their appointment if selected by a County Committee.

A number of men who have already passed through the school are now employed by County Committees at a salary of £2 per week, together with expenses of locomotion.

While in training the pupils will require to find lodging in the village of Glasnevin, and will be subject to the conditions under which the gardeners at the College are employed. The wages will be from 18s. to 25s. per week, according to qualifications.

In addition to work in the gardens, the pupils will be given facilities for studying the application of scientific principles underlying Hortiture.

Forms of application to attend the examination may be had upon application to

The Secretary,

- 0

Department of Agriculture and Technical Instruction for Ireland,

Upper Merrion-street, Dublin.

N.B.—Particulars as to date and place of examination in Dublin will be communicated to applicants later on.

#### DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

#### SCHOOL OF RURAL ECONOMY,

ST. MARY'S CONVENT OF MERCY, PORTUMNA, COUNTY GALWAY.

#### Residential Pupils.

Arrangements have been made for the reception of a small number of

residential pupils.

The course of instruction is intended to qualify the pupils to perform efficiently the work of rural life, and includes—Dairying, Poultry-keeping, Horticulture, Household Management, Cookery, Laundry-work and Needle-work.

The school year extends from the beginning of October to the end of August, and is divided into two sessions, which begin, respectively, in October and in March.

The fee for tuition, board and lodging during one session is £3 3s., and is payable to the Manager on entrance.

The School is open to female pupils over sixteen years of age without

restriction as to religious denomination.

Intending pupils are required before admission to the school, to produce certificates of good health and character, and to pass an examination in the elements of English and Arithmetic.

Pupils whose conduct and progress during their first session are satisfactory are eligible for admission to a second consecutive session on payment of the above-mentioned fee.

Application for admission must be made on the prescribed form,

which can be obtained from

The Secretary,

Department of Agriculture and Technical Instruction for Ireland, Upper Merrion street, Dublin.

#### III.—TECHNICAL INSTRUCTION.

Form S. 33.

DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND, UPPER MERRION-STREET, DUBLIN.

#### ROYAL COLLEGE OF SCIENCE, DUBLIN.

SCIENCE AND TECHNOLOGICAL SCHOLARSHIPS, 1906.

A limited number of Scholarships and of Teacherships-in-Training, tenable at the Royal College of Science, Dublin, will be offered for competition among Students of Science and Technology in 1906.

The Scholarships are of the value of £50 per annum, and, in addition, entitle the holder to free instruction during the Associate Course, and third-class railway fare for one journey each session to and from Dublin.

A Teachership-in-Training entitles the holder to free instruction during the Associate Course, a maintenance allowance of 21s. per week for the session of about forty weeks each year, and third-class railway fare for one journey each session to and from Dublin.

The Associate Course extends over three years, and the College Session lasts from the beginning of October until the end of June each

year.

Holders of Scholarships and Teacherships-in-Training will be required to devote their whole time to the work of the Associate Course, to comply with the regulations of the College, and to pass the examinations required for the Associateship. The continuance of the Scholarship or Teachership-in-Training for a second or a third session will depend upon the ability and application which the Student has shown during the previous session or sessions at the College.

Candidates for Scholarships and Teacherships-in-Training must be not less than sixteen nor more than thirty years of age on the 1st June, 1906. Holders of Royal Exhibitions or National Scholarships, and present or past Students of the Royal College of Science, are ineligible

as candidates.

Candidates must have been born in Ireland, or have been resident in

Ireland for three years prior to the 1st June, 1906.

Candidates will have to satisfy the Department as to their knowledge of English and of one other language (Greek, Latin, Irish, French, or German). In these subjects a pass in the Senior Grade of the Intermediate Education Board's Examinations, in the First Arts Examination of the Royal University of Ireland, or the equivalent of these, will be accepted as satisfactory. Those candidates who cannot thus satisfy the Department as to their knowledge of the qualifying subjects will be examined on the Pass Course for the Senior Grade of the Intermediate Education Board's Examinations of 1906.

The competition will be confined to Mathematics, Experimental Science,

and Drawing.

The Syllabus in Mathematics will be the Pass Courses in Arithmetic, Geometry, Algebra and Trigonometry for the Senior Grade of the Intermediate Education Board's Examinations of 1906; in Experimental Science, the Syllabuses (both Third and Fourth Years) of the Special Courses of Experimental Science of the Department's Programme for Day Secondary Schools; and in Drawing, the First and Second Year Syllabuses of the Programme for Day Secondary Schools.

In Experimental Science, candidates will be allowed the choice of one of the following subjects:—Physics, Chemistry, Mechanical Science,

Botany, Geology, Physiology and Hygiene.

The Examination will be held in Dublin on the days and at the hours shown below:—

Tuesday, 3rd July.—English, 10 a.m.-1 p.m.; Greek, Latin, Irish, French, or German, 2 p.m.-5 p.m.

Wednesday, 4th July.—Mathematics, 10 a.m.-1 p.m.; Experimental Science (Written Test), 2 p.m.-5 p.m.

Thursday, 5th July.—Experimental Science (Practical Test), 10 a.m. 1 p.m.; Drawing, 2 p.m.-5.10 p.m.

NOTE.—Text Books, other than those referred to in the Syllabuses, are not prescribed for the examinations.

Candidates must themselves bear any expenses incurred by them in connection with attendance at the examination.

Scholarships or Teacherships-in-Training will not be awarded to candidates who do not show in the course of the examination that they are capable of taking full advantage of the instruction provided at the Royal College of Science. Candidates with physical defects of voice, sight, or hearing, will not be regarded as eligible for Teacherships-in-Training.

Successful candidates will be required to furnish a Medical Certificate of Health, an authenticated copy of Certificate of Birth, and satisfactory

testimonials from two responsible persons.

The Department reserve the right at any time to determine, without notice, a Scholarship or Teachership-in-Training, upon being satisfied that its continuance is for any reason undesirable.

The decision of the Department in all questions arising in connection with the Scholarships and Teacherships-in-Training shall be final.

The Department do not undertake to employ Teachers, nor to find

employment for them, at the close of the period of training.

Applications for admission to the examination must be made, not later than the 30th April, on Form S. 34, copies of which may be obtained, after the 1st February, 1906, upon application to the Secretary, Department of Agriculture and Technical Instruction for Ireland, Upper Merrion Street, Dublin, or to the Registrar, Royal College of Science, St. Stephen's Green, East, Dublin.

Applications received after the 30th April will be too late for consideration. Applications for Forms are not regarded as applications for admission to the examination. Only those candidates who present an official acceptance of the Form of application will be admitted to the Examination Room.

Form S. 89.

DEPARTMENT OF AGRICULTURE AND
TECHNICAL INSTRUCTION FOR IRELAND,
UPPER MERRION-STREET, DUBLIN.

IRISH TRAINING SCHOOL OF DOMESTIC ECONOMY.

#### TEACHERSHIPS-IN-TRAINING, 1906.

The Department will award in July, 1906, not more than (a) ten Open Scholarships, and (b) ten Limited Scholarships, to assist Domestic Economy Students in undertaking the full course of instruction at the Irish Training School of Domestic Economy, Kildare street, Dublin.

Scholarships will entitle the holders to free admission to the full course of training as Teacher of Domestic Economy subjects. The School is not residential, and no subsistence allowance is given.

The Scholarships will be awarded as the result of a competitive examination, partly written, partly vive voce, to be held in Dublin, Belfast, Cork, and Galway, on Tuesday, the 3rd July, 1906, beginning

at 10 a.m. Should a sufficient number of candidates present themselves, examinations will also be held at Londonderry, Sligo, Limerick, and Waterford.

The award will be made on the following conditions:-

- Candidates must be not less than nineteen and not more than thirty years of age on the 1st September, 1906. This rule will be strictly adhered to.
- Candidates with physical defects of voice, sight, or hearing will
  not be regarded as eligible for Scholarships. Successful
  candidates will be required to furnish a medical certificate of
  health, an authenticated copy of certificate of birth, and
  satisfactory testimonials from two responsible persons.
- Candidates must satisfy the Department that they have had a good general education.
- Candidates for either class of Scholarship must have been born in Ireland, or have been resident in Ireland for three years prior to the 1st September, 1906.
- 5. The Subjects and Time Table of the Examination will be :--

Arithmetic (General) 10 a.m. to 11.45 a.m.

English, 12 noon to 1.45 p.m.

Irish, French, or German, 2.15 p.m. to 4 p.m.

- Reading aloud. At some time during the progress of the examination the Candidate will be asked to read aloud a passage of English prose of not more than ordinary difficulty.
- The standard will be equivalent to that required for a pass in the Middle Grade of the Intermediate Education Board's Examinations. Questions will not, however, be set from any prescribed text-books.
- 6. Twenty-five marks will be the maximum assigned for reading aloud; one hundred marks for Arithmetic; one hundred marks for English; and one hundred marks for the other language selected. Candidates must intimate in their form of application whether they propose taking Irish, French, or German.
- 7. Candidates must themselves bear any expenses incurred by them in connection with attendance at the examination.
- 8. The selection of the Students-in-Training will, in the first instance, be provisional. Those selected will take a number of trial lessons at the Training School; the final award of a Scholarship will be made by the Department on receipt of the report from the Training School, and is subject to the condition that the Student shows in the trial lessons that she is capable of making full use of the instruction provided at the Training School, and that she is generally suitable for employment as a teacher.
- After final selection Students-in-Training must take up that course which will most suit the convenience of the Training School.

- 10. The Department reserve the right at any time to determine, without notice, any Scholarship, upon being satisfied that its continuance is for any reason undesirable.
- 11. The Students-in-Training must conform to the regulations of the Irish Training School of Domestic Economy.
- 12. Candidates who accept Scholarships, but leave the school before the completion of their course of training, will be required to pay the fees for the period during which they were in attendance at the school.

THE Limited Scholarships are intended as rewards to students for successful attendance and work at Local Technical Schools or Classes, under the direction of properly constituted Technical Instruction Committees of Local Authorities who had a Scheme of Technical Instruction The Limited Scholarships in operation during the Session 1905-6. will entitle the holders to free admission to the full course of training as Teacher of Domestic Economy subjects, provided that the Local Technical Instruction Committee who nominate the candidate undertake to pay ten guineas, being half the fees for the full two years' Nominations must be made not later than the course of instruction. 18th June, upon Form S 171, which must also contain an account of attendance and work done at Local Technical Schools and Classes. Candidates who have not attended such courses will be ineligible for these Scholarships.

THE Open Scholarships will, in the first instance, subject to the terms of the conditions of award on page 1, be offered provisionally to the ten Candidates who stand highest on the examination list. Should one of the ten successful Candidates decline to accept a Scholarship it may be offered to the next in order of merit, and so on.

THE Limited Scholarships will be offered to Candidates in order of merit who are not successful in obtaining Open Scholarships, and who have been nominated by the above-mentioned properly constituted Committees.

For the present Competition not more than one Candidate thus nominated by any Technical Instruction Committee will be awarded a Limited Scholarship. Should, however, a Candidate nominated for a Limited Scholarship be successful in obtaining an Open Scholarship, another Candidate nominated by the same Technical Instruction Committee will be eligible for a Limited Scholarship, and so on.

The decision of the Department in all questions arising in connection with these Scholarships must be considered as final.

PROSPECT OF FUTURE WORK. Candidates who attend regularly and punctually the full course of instruction at the Training School and pass all the examinations held during the course will obtain a diploma from the Department at the end of their course of training. These diplomas are recognised by the Department as evidence of qualification to teach under Technical Instruction Committees of Urban or County Councils. They will also be regarded as evidence of qualification to teach the Department's Programme of Domestic Economy in Day Secondary Schools.

The Department do not undertake to employ, or to find employment for, teachers at the close of the period of training.

The names of the Candidates for both Limited and Open Scholarships must be forwarded on Form S. 170, so as to reach the offices of the Department not later than the 30th April, 1906. Applications for Forms are not regarded as applications for admission to the examination. Only those Candidates who are able to present an official acceptance of the form of application will be admitted to the examination rooms.

Copies of Form S. 170 and of Form S. 171 may be obtained upon application to the Secretary, Department of Agriculture and Technical Instruction for Ireland, Upper Merrion Street, Dublin, after the 1st January, 1906.

Form S. 176.

Local Scholarship Examinations.

DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

### LOCAL SCHOLARSHIP EXAMINATIONS, 1906.

The following arrangements are proposed to be made by the Department for the conduct of examinations in connection with the award, in 1906, of Scholarships to be granted under schemes of technical instruction in operation in Counties and Urban Districts in Ireland.

The examinations are conducted free of charge to Committees; the Department undertake the preparation of examination papers and the revision of answers; and they issue lists of candidates in order of merit to the Committees concerned.

The Department will not be prepared to hold any examinations for Scholarships, in 1906, other than those enumerated below.

Committees will be required to find Superintendents for the examinations, and to arrange for suitable accommodation.

1.

FOR SCHOLARSHIPS TENABLE AT DAY SECONDARY SCHOOLS.

On June 30th.—This examination will be suitable for the award of County and Urban District Scholarships tenable at approved Day Secondary Schools.

The subjects and time of examination will be :-

Arithmetic,	•	•.	11 a.m. to 12.80 p.m.
English, .			1 p.m. to 2.15 p.m.
Drawing			2.30 p.m. to 3.30 p.m.

#### II.

FOR SCHOLARSHIPS TENABLE AT TRADE PREPARATORY SCHOOLS.

On June 28th.—This examination will be suitable for the awards of Scholarships tenable at, and for entrance qualification to, Day Trade Preparatory Schools, working under the Department's Regulations.

The subjects and time of examination will be :-

English, . . . . 10 a.m. to 12 noon.

Arithmetic, . . . 12.30 p.m. to 2.30 p.m.

Drawing, . . . 2.45 p.m. to 4 p.m.

#### III

FOR SCHOLARSHIPS TENABLE AT RESIDENTIAL SCHOOLS OF DOMESTIC ECONOMY.

On June 28th.—This examination has been arranged for the convenience of those Committees which have decided that such Scholarships shall be awarded as the result of a competitive examination. It will be suitable for the award of Scholarships tenable at, and for entrance qualification to, such Residential Schools of Domestic Economy as are working under the Department's Regulations.

The subjects and time of examination will be:-

#### SYLLABUSES OF EXAMINATIONS.

The Syllabuses are the same for each of the examinations mentioned, but a higher standard of work will be looked for in the Trade Preparatory School Scholarship and Entrance Examination than in the other examinations.

Candidates may be examined on any part of these Syllabuses.

#### ARITHMETIC:

The principles of Vulgar and Decimal Fractions, with examples involving addition, subtraction, and multiplication.

Proportion, Simple Interest, Practice, Unitary Method.

The Metric System.

Methods of Weighing and Measurement.

Measurement of lengths, areas, and volumes.

#### ENGLISH:

Composition. A short essay, or letter, of thirty or forty lines—with correct spelling, grammar, and punctuation—on some familiar subject.

Ability to answer in fully-formed sentences questions on the meaning of words and phrases, and on the matter of a passage read.

Grammar. The construction of words; prefixes, affixes, and roots. Analysis of simple and complex sentences.

Attendana or simple must combine

Correction of faulty sentences.

Paraphrasing a short poetical extract.

GENERAL KNOWLEDGE: (For Domestic Economy Scholarship Examinations).

Questions on familiar subjects which a pupil would be expected to be acquainted with from home or school life, and from general observation and reading.

#### DRAWING:

1. Freehand Drawing.

2. Simple exercises in Design.

- 3. Model Drawing of Simple Common Objects.
- 4. Simple Geometrical Drawing.

5. Memory Drawing.

Form S. 31.

DEPARTMENT OF AGRICULTURE AND
TECHNICAL INSTRUCTION FOR IRELAND,
UPPER MERRION-STREET, DUBLIN.

# SPECIAL EXAMINATION FOR TEACHERS' QUALIFICATIONS IN MANUAL TRAINING (WOODWORK).

A special examination for Teachers' qualifications in Manual Training (Woodwork) will be held in Dublin on Tuesday and Wednesday, 26th and 27th June, 1906. The Subjects and Time Table of the examination will be:—

Tuesday, June 26th, . 10 a.m. to 1.30 p.m., . Drawing. . Theory.

Wednesday, June 27th, 10 a.m. to 1 p.m., . Practical Woodwork Test.

,, , . 2 to 5 p.m., . . Drawing on the Black board

Black board and Demonstration Exercise.

For Syllabuses of the subjects of examination see circular letter No. 24.

Tools, wood, paper, pens, and ink will be provided by the Department, but candidates will be required to bring mathematical instruments, drawing boards (Imperial size) pencils, erasers, &c., for the examination in Drawing; and, although tools for the Practical Woodwork Test will be provided by the Department, candidates are advised to bring their own, as no allowance can be made should the candidate not consider the tools supplied as satisfactory.

Application for admission to the examination must be made on Form

S. 32, before the 1st May.

No fee will be charged for this examination, but candidates will be required to defray all travelling and other expenses incurred by them.

#### DEPARTMENT OF AGRICULTURE AND

TECHNICAL INSTRUCTION FOR IRELAND, Upper Merrion-Street,

Dublin, 22nd November, 1905.

No. 29808-05.

SIR, OR MADAM,

I have to direct your attention to the Circular Letter (No. 38), issued from these offices in June last, relative to the grants hitherto payable by the Department in aid of the purchase of equipment for use in connection with Science and Art Classes, and with classes in Experimental Science, Drawing, and Manual Work in Day Secondary Schools.

It was pointed out that the funds placed at the disposal of the Department for the purpose in question during the current financial year—the last year in which such funds will be available—are strictly limited, and that the Department found it necessary to fix the 1st September as the latest date upon which applications for the allocation of grants might be received, and the 1st December as the date by which applications for the payment of the grants promised must be made. The sums included in the applications forwarded before the former date exceeded the amount in the Department's hands; but, as it was anticipated that the purchase of a certain quantity of the equipment proposed by the School Managers would not be completed in time to admit of the grants allocated being claimed by the 1st December, sums were promised on account of all the applications forwarded before 1st of September.

In cases in which the Department have promised a grant unconditionally, they will be prepared to pay the full amount elaimable in respect of those applications for payment which are received in proper form before the 1st proximo. The sum of money remaining after these applications have been disposed of will be divided between the claims received after the 1st proximo and before the 1st February next, in the proportion of the amounts which would have been payable on account of such applications had the funds for this purpose not been limited.

The 1st February next has been decided upon as the latest date upon which Forms S 6 may be accepted, and in no case will claims received after that date be considered by the Department.

I am,

Sir, or Madam,

Your obedient Servant,

T. P. GILL,

Secretary.

## IV.--VETERINARY.

LIST OF SHEEP DIPPING PREPARATIONS approved by the Department of Agriculture and Technical Instruction for Ireland, under the Sheep Scab (Ireland) Order of 1905, additional to those specified in the Second Schedule of that Order. (See Journal, vol. V., p. 564).

LIST No. 1.

(NOTE.—Consecutive numbers will be given to any lists of a similar character that may be subsequently issued).

Date of Letter of Approval.		Name of Dip.	Name and Address of Manufacturer.		
20th April, 1905,		Cooper's Sheep Dipping Powder,	Messrs. W. Cooper & Nephews, Berkhamsted, England.		
Do.,	•••	<ol> <li>M'Dougall's Sheep Dip, Paste or Hot Water Quality.</li> </ol>	M'Dougall Bros., 68 Port-street, Manchester		
Do.,	•••	2. M'Dougall's Sheep Dip (Cakes and Blocks), Hot Water Quality (Patented).	do., do.		
Do.,	•••	3. M'Dougall's Arsenic-Sulphur Dip.	do., do.		
Do.,	•••	Bailey's Powder Sheep Dip,	William Bailey & Son, Horseley Fields Works, Wolverhampton.		
Do.,	•••	Bailey's Fluid (Non-Poisonous) Sheep Dip and Cattle Wash.	do., do.		
Do.,	•••	"Ialine" Sheep Dip,	Burt, Boulton, & Haywood, Ltd., 64 Cannon-street, London.		
Do.,	••	Bigg's Paste Dip,	Thomas Bigg. 111 Great Dover- street, London, S.E.		
Do.,		Bigg's "Glenovis,"	do., do.		

LIST No. 2.

Date of Letter of Approval.		Name of Dip.	Name and Address of Manufacturer.		
4th May, 1905,	•••	"Golden Magnet" Sheep Dipping Powder.	Cope Bros., & Co., Ltd., Lor Nelson-street, Liverpool.		
5th May, 1905,	•••	1. Battle's Powder Dip,	Battle, Maltby, & Bower, Victor, Chemical Works, Lincoln.		
<b>D</b> o.,	•••	2. Battle's Fluid Sheep Dip,	do., do.		
8th May, 1905,	: <b>**</b>	1. "Highland" Powder Sheep Dip.	Alex. Robertson, Argyle Chemi cal Works, Oban, N.B.		
Do.,	•••	2. "Highland" Fluid Sheep Dip,	do., do.		
Do.,	•••	3. Poisonous Paste "Highland" Sheep Dip.	đo, đ <b>o</b> .		
Do.,	•••	<ol> <li>Non-Poisonous Paste "High- land" Sheep Dip.</li> </ol>	do., · do.		
Do.,	•••	5. Special Highland Fly Dip	do., <b>do</b> .		
Do.,	•••	1. Quibell's Powder Sheep Dip,	Quibell Brothers, Ltd., Newark England.		
<b>D</b> o.,		2. Quibell's Liquid Sheep Dip,	do., <b>do</b> .		
<b>D</b> o.,	•••	1. "John O'Gaunt" Paste Dip,	Maudsley & Son, The Arcade Lancaster.		
Do.	•••	2. "John O'Gaunt" Fluid Dip,	do., do.		
Do.,	***	Grindley's "Pioneer Brand" Sheep Dip.	Grindley & Co., Ltd., Poplar London, E.		

## LIST No. 3

Name of Dip.	Name and Address of Manufacturer or Proprietor.		
Gorry's Powder Dip (in the proportion of 30 ozs. of Dip to 20 gallons of water).	Mr. Joseph Gorry, 54 South Main- street, Naas.		
Mallen's Powder Dip (in the proportion of 5 lbs. of Dip to 44 gallons of water).	Messrs, Mallen & Co., 89 Upper Dorset- street, Dublin.		
"Harvey's Improved Sheep Dip" (in the proportion of 1 gallon to 30 gallons of water).	Mr. J. W. Harvey, L.P.S.I., 31 Great George's-street, Cork.		
Lawes' Powder Dip (in the proportion of 2 lbs. of Dip to 20 gallons of water).	Lawes' Chemical Company, Limited, 59 Mark Lane, London, E.C.		
Lawes' Fluid Dip (in the proportion of 1 gallon of Dip to 40 gallons of water).	do. do.		
Lawes' Paste Dip, Poisonous (in the proportion of 1 lb. of Dip to 4 gallons of water).	do. do.		
Lawes' Paste Dip, Non-Poisonous (in the pro- portion of 1 lb, of dip to 4 gallons of water).	do. do.		
Lawes' Kalyptos Sheep Dip (in the proportion of 5 lbs. of Dip to 30 gallons of water).	do. do.		
Kiloh's Sheep Dipping Powder (in the proportion of 1½ lbs. of Dip to 13 gallons of water).	Messrs. Kiloh and Company, Limited, Cork.		
Kiloh's Sheep Dipping Composition (in the pro- portion of 4 lbs. of Dip to 13 gallons of water).	do. do.		
Jeyes' Sheep Dip (in the proportion of 1 gallon of dip to 60 gallons of water).	Jeyes' Sanitary Compounds Company, Ltd., 64 Cannon-st., London, E.C.		

## LIST No. 4.

	Proportion appro			
Name of Dip.	Quantity of Dip.	No. of Gallons of Water.	Name and Address of Manufacturer.	
Quibell's Combined Paste Dip (Arsenical and Carbolic) Quibell's Non-Poisonous Cake Dip.  M'Leod's Non-Poisonous Sheep Dip. M'Leod's Non-Poisonous Sheep Dip. Snowdown Sheep Dip, Hibernia Sheep Dip, O. (Hot Water Quality), Special Fly Dip, The Universal Sheep Dipping Powder. Improved Concentrated Liquid Sheep Dip. Liquid or Cold Water Quality Sheep Dip. Liquid or Cold Water Quality Sheep Dip. Lattle's Paste Dip, Non-Poisonous, Battle's Paste Dip, Poisonous,	14 lbs., 2 lbs., 1	5 25 13 25 50 40 50 20 90 20 100 50	Messrs. Quibell Brothers, Newark, England.  Cork Chemical and Drug Company, Limited, Cork.  Messrs. F. H. M'Leod & Sons, 61 Bishop street, Anderston, Glasgow.  Messrs. Snowdon, Sons & Co., Limited, Milwall, London, E.  The North of Ireland Chemical Company, Limited, Belfast.  Messrs. M'Dougall Brothers, 68 Port street, Manchester.  Messrs. Battle, Maltby & Bower, Viotoria Chemical Works, Lincoln.	

## NOTES AND MEMORANDA.

A meeting of the Agricultural Board was held on Wednesday,

15th November, at the offices of the Department, Upper Merrion-street, Dublin.

Meetings of the Boards.

The following members of the Board were present:—The Right Hon. Sir Horace

Plunkett, P.C., K.C.V.O., F.R.S., Vice-President of the Department, in the chair; Mr. Alexander L. Clark, J.P.; Mr. Robert Downes, J.P.; Colonel Nugent T. Everard, D.L.; His Grace the Most Rev. John Healy, D.D., Lord Archbishop of Tuam; Mr. Patrick J. Hogan, J.P.; Mr. Arthur S. Lough, J.P.; The Right Hon. Lord Monteagle, K.P., D.L.; Mr. H. de F. Montgomery, D.L.; Colonel John P. Nolan, J.P., M.P.; and Mr. Patrick J. O'Neill, J.P.

Mr. T. P. Gill, Secretary of the Department; Professor J. R. Campbell, Assistant-Secretary in respect of Agriculture; Mr. J. S. Gordon, B.Sc., Chief Agricultural Inspector; Mr. R. Cantrell, I.S.O., Chief Clerk; Mr. W. G. S. Adams, M.A., Superintentent of the Statistics and Intelligence Branch; Mr. J. P. Walsh, Clerk in Charge of Accounts; Mr. J. D. Daly, M.A., Senior Staff Officer (who acted as Secretary to the meeting), and Mr. J. V. Coyle, were also present.

A meeting of the Board of Technical Instruction was held on Thursday, the 23rd November, at the Offices of the Department, Upper Merrion-street, Dublin.

The following were present:—The Most Rev. John Clancy, D.D., Lord Bishop of Elphin; Mr. James Dempsey; Mr. Christopher J. Dunne, J.P.; Rev. T. A. Finlay, S.J., F.R.U.I.; Sir Edward Fitzgerald, Bart.; Mr. T. C. Harrington, M.P.; Sir James Henderson, D.L.; Alderman Michael Joyce, M.P., Mayor of Limerick; Very Rev. P. J. Lally, P.P.; Mr. William R. J. Molloy, M.R.I.A.; Mr. Alexander Taylor; Mr. Thomas H. Teegan; Mr. William J. Woodhams. Mr. T. P. Gill, Secretary of the Department; Mr. George Fletcher, Assistant-Secretary in respect of Technical Instruction; Mr. R. Cantrell, I.S.O., Chief Clerk; Mr. W. G. S. Adams, M.A., Superintendent of the Statistics and Intelligence Branch; Mr. W. Vickers Dixon, B.A., Senior Inspector for Technical Instruction; Mr. J. P. Walsh, Clerk in

Charge of Accounts; Mr. J. D. Daly, M.A. (who acted as Secretary to the meeting); and Mr. A. Kelly. In the absence, through illness, of the Right Hon. Sir Horace Plunkett, the chair was taken by the Secretary of the Department.

The Board decided to send a message to the Vice-President expressing a hope for his speedy restoration to health.

Figures were submitted showing the progress of the work of Technical Instruction throughout the country.

The Board had under consideration a report on the Short Summer Courses for Teachers which were held in July and August. They had also under consideration a report on the allocation of Travelling Scholarships in Commercial and Industrial subjects for which provision had previously been made with the concurrence of the Board.

Suggestions were under consideration regarding the method of awarding Scholarships for boys, tenable at Secondary Schools under County Schomes.

It was announced that the Treasury had sanctioned the Department's revised scheme for the administration of the Science and Art Grants for schools other than Day Secondary Schools, and that the new regulations would come into operation for the session 1906-7.

Technical Instruction schemes in respect of the session 1905-6 for the following urban and county areas, were brought forward by the Department.

Urban Districts.—Athlone, Armagh, Bray, Clonmel, Coleraine, Enniscorthy, Kingstown, New Ross, Pembroke, Rathmines and Rathgar, Tralee, Warrenpoint.

Counties.—Antrim, Armagh, Cavan, Clare, Cork, Down, Fermanagh, Galway, Kilkenny, King's County, Leitrim, Limerick, Longford, Louth, Mayo, Meath, Monaghan, Tipperary (North Riding), Tipperary (South Riding), Tyrone, Westmeath, Wexford.

The schemes having been discussed, the Board concurred in the application of grants from the funds of the Department in accordance with the proposals submitted.

The Board concurred in further provision being made for the maintenance of the Irish Training School of Domestic Economy.

On the 8th November a representative deputation waited upon
Sir Horace Plunkett at the Offices of the
Irish Produce Department of Agriculture and Technical
in British Markets. Instruction, with reference to the appointment of official representatives in the
markets of Great Britain in connection with the sale of Irish agricultural produce.

The following were the members of the deputation:—Messrs. R. Gibson (Public Creamery Market, Limerick), C. J. Dunn (Chairman, Cork Butter Market Trustees), J. J. Hurley (President, Creamery Managers' Association), P. Whelan, Co. C. (Clones District Conference), T. M. English (Tipperary District Conference), P. P. Moloney (Solohead Co.operative Dairy Society), E. Connolly (Grange Co-operative Dairy Society), D. Hegarty (Secretary, Creamery Managers' Association), J. O'Shea (Irish Firkin Butter and Egg Trader, Tipperary), J. Flynn (Butter, Egg and Bacon Trader, Cork), M. J. Nolan, J.P. (Chairman, County Kerry Committee of Agriculture and Technical Instruction), W. L. Stokes, J.P. (Co-operative Wholesale Society, Limerick), D. L. Roche (Irish Co-operative Agency, Limerick), Rev. L. L. Leader (Private Dairy, North Cork), and Sir Hawtry Cox (Private Dairy and Poultry Farm, Templemore).

There were present, representing the Department, Professor Campbell, Messrs. Cantrell and Prentice, and Lord Ikerrin. The Board of Agriculture and Fisheries of Great Britain was represented by Mr. E. G. Haygarth Brown, Superintending Travelling Inspector.

Letters of apology for non-attendance from the Duke of Abercorn, K.G., Sir Thomas Cleeve, D.L., Captain Loftus Bryan, D.L., and Mr. P. Vaughan were read.

The various points enumerated in a memorandum on the subject, which had already been forwarded to Sir Horace Plunkett, were then considered seriatim, and a discussion followed, in the course of which the different members of the deputation expressed their views on the matter. Special emphasis was laid on the need which, in their opinion, existed for the appointment of representatives in Great Britain with a view to the detection of the various fraudulent practices which were causing such serious injury to Irish producers and traders.

In his reply, the Vice-President gave a summary of the steps which the Department had already taken for the prevention and

detection of the practices complained of, and stated that the Department fully recognised the seriousness of the situation which had arisen. The Department had been for some time considering the advisability of making such an appointment as that desired by the deputation. He was now prepared to say definitely that such an officer would be appointed at an early date, subject, of course, to the necessary concurrence of the Agricultural Board.

The deputation, after thanking the Vice-President for his reception of them, withdrew.

A course of lectures and demonstrations on Sanitary Science will be given by Professor Antony M.R.C.P.I., in the Lecture Theatre, Royal Lectures on Sanitary Science. College of Science, St. Stephen's-green, Dublin. The course will consist of twenty lectures, and will be suitable for candidates for the position of sanitary Inspector, for Plumbers and Builders, and others interested in Sanitary Science and Public Health. Copies of the Syllabus, Tickets, etc., can be obtained from the Registrar, Royal College of Science, St. Stephen's-green, Dublin.

At a meeting of the Council of the Royal Agricultural Society
of England, held on January 10th, the

A National Council
for Agricultural
Research.
Board of Agriculture and Fisheries, stating
that he hoped to forward shortly to the
Society a scheme of the Board of Agriculture for the establishment
of a National Council for Agricultural Research.

During the past year the Department received frequent inquiries as to the effect of the use Nitro-Culture Nitro-cultures as recommended by Experiments. the United States Department of Agritherefore decided It was culture. conduct a series of experiments in Ireland with a view of testing the influence of such cultures on the growth of the leguminous crops most generally grown by Irish farmers. These experiments were carried out on the Department's farms at Glasnevin, Ballyhaise,

and Clonakilty; and also by the agricultural instructors in the following counties: Antrim, Armagh, Carlow, Down, Kildare, Kilkenny, Monaghan, Tyrone, Westmeath, Wexford, and Wicklow. The crops with which the experiment was tried were—crimson clover, red clover, white clover, vetches, peas, lucerne and sainfoin.

The results on the whole cannot be said to be other than negative, that is to say, in the majority of cases no beneficial effects from the use of Nitro-cultures could be observed. No influence of the cultures on the growth of vetches, peas, lucerne and sainfoin was noticed. In a few cases, however, some slight improvement of the clover crop was perceived. For instance, in one county (Monaghan) the report shows that on one farm, where clover has usually been a failure, a quantity of clover grew on the plot on which inoculated seed had been sown, while there was practically no clover on the plot sown with untreated seed. On another farm, in the same county, where clover generally grows well no difference was observed between the two plots. Wherever clover seemed to have derived benefit from the use of the cultures the experiment was carried out on such infertile soils as poor thin soil, poor gravelly soil or heavy clay.

Although it would be unfair to draw a definite conclusion from the trials of one year, it may be stated that these experiments, so far as they have gone point to the probability that on land of average quality and fertility, where clovers and other leguminous crops grow even fairly well, no benefit is derived from the use of the cultures.

Under the circumstances, therefore, the Department cannot advise the general use of Nitro-cultures. Whether any benefits may be obtained from the use of these cultures on land of very poor quality, or on land which has hitherto completely failed to grow clover, remains still to be determined.

A Commission has been appointed to inquire into and report upon
the methods of initiating, executing, and
maintaining schemes of arterial drainage in
Ireland. Ireland, under the statutes now in force, and
their practical working, whether any reforms

or alterations of the existing methods of consolidation of existing statutes are desirable, and, if so, what legislation is necessary for carrying them into effect.

The Commissioners are as follows: ---

Sir Alexander Binnie, President of the Institution of Civil Engineers, England (Chairman); The Right Honourable Thomas Andrews, Chairman, Co. Down County Council; Stephen Brown, Esquire, Chairman of the County Kildare County Council; James Dillon, Esquire, Member of the Institution of Civil Engineers, Ireland; J. H. Ryan, Esquire, Member of the Institution of Civil Engineers, Ireland.

The Commission is invested with the usual power to examine witnesses, call for books, papers, and documents, and to visit and inspect such places as may be deemed expedient.

Mr. W. S. Strange, of the Board of Works, has been appointed Secretary to the Commission.

The Commission held its first session on Monday, January 2nd.

A Parliamentary paper just issued (Cd. 2715-1905) contains an extract from the Minutes of Proceedings of the Senate of Canada relating to the embargo on Canadian cattle. The extract read as follows:—

Resolved. That the Senate of Canada desires to call the attention of the Imperial Government to the fact that Canadian herds are now and have been, for many years past, free from those particular diseases against which the embargo has been imposed.

That this has been repeatedly admitted by the Imperial authorities themselves.

That under these circumstances, the continued prohibition of the importation of Canadian cattle on the pretext that there is danger of the spread of those particular diseases among the British herds, is an unjust imputation on the condition of Canadian cattle, and the Senate of Canada respectfully suggests that the Imperial Act based thereon should be repealed. And that a copy of this resolution be transmitted to the Right Honourable the Premier of England and to the Right Honourable the President of the Board of Agriculture.

Attest: --

Saml. E. St. O. Chapleau, Clerk of the Senate.

The Secretary of State for the Colonies stated in his reply that the Government having given the fullest consideration to the representations made to them, regrets that it is unable to propose to Parliament any amendment of the existing law. In his reply the Colonial Secretary enclosed the following extract from a letter from the Board of Agriculture:—

Experience has shown that the existing statutory requirement that all cattle imported into this country shall be slaughtered in wharves provided for the purpose at the port of landing is no obstacle to the development and maintenance of a large and valuable trade. In the case of Argentina, the number of cattle imported into Great Britain steadily rose from 4,200 in 1891 to 85,000 in 1899, when the trade was interrupted by the introduction of foot-and-mouth disease in that country. The value of the imports in question was £68,000 in 1891 and £1,392,000 in 1899. During the whole of that period the requirement of slaughter was The case of the United States shows similar results. The number of cattle imported in 1879 was 76,000 with a value of £1,782,000. In 1904 the number imported was 401,000 with a value of £7,160,000. Slaughter at the port of landing was required for the first time in 1879, and has been enforced ever since. Board are glad to observe that similar results are indicated in the case of Canada. The imports during the past two years have been as follows:-

	-				No. of Cattle Imported.	Declared Value.
						£
1903,	•••	•••	•••	•••	190,812	3,315,762
1904,	•••	•••	•••		146,598	2,547,451

The highest figure recorded prior to 1892, when slaughter at the port of landing was first required, was in 1890. The imports in that year were 120,469 with a declared value of £1,892,298.

The existing law does not cast any stigma or discredit upon Canadian cattle, for it holds good not only in the case of the United States and other foreign countries, but also in that of every British colony, including both Australia and New Zealand, whence live cattle have in the past been imported into Great Britain. It is in fact a sanitary law of universal application, of great importance to stockowners at home as a valuable safeguard against the introduction of disease, but not at all inconsistent

with the transaction of a large and growing trade, as has already been shown.

The experience of Argentina in 1900, and more recently of the United States in 1902, has shown how suddenly and unexpectedly foot-and-mouth disease may make its appearance in a country, quite irrespective of the maintenance of an efficient veterinary organisation. In the former case diseased animals were actually imported into this country, and it was only by dint of good fortune and the most strenuous exertions that the infection was kept within the limits of the Foreign Animals Wharves. A similar result might well have happened in 1902 in the case of the United States, notwithstanding the ability and the energy of the Department of Agriculture in that country.

The enormous losses which British agriculturalists have suffered during the last thirty years, mainly by reason of the increased pressure of colonial and foreign competition, make it more than ever necessary that every possible precaution should be taken against the introduction of disease, consistent with the reasonable requirements of colonial producers and the interests of consumers at home. The consequences of the recurrence in Great Britain of epidemics of disease, such as have been experienced in the past, would now be disastrous, and consumers as well as producers would be affected throughout the country. It is therefore in the general interest that no risk should be taken which can be avoided by the maintenance of a law which provides a considerable measure of security against the introduction of disease. and same time does so without any serious stoppage of trade and without rendering it necessary for any action of an invidious character to be taken in regard to the cattle imported from a particular colony or country.

Earl Carrington, the President of the Board of Agriculture, who was accompanied by Sir Thomas Elliott, the An English and Scotch permanent Secretary of that Department, reDeputation wishes ceived, on the 5th January, a deputation the Embargo removed. from the counties of Norfolk, Sussex, Aberdeen and Perth, the City of Glasgow, and the towns of Swansea, Birkenhead, Northampton, Southampton, Derby and Newport (Mon.), asking that the embargo should be removed. Bailie Watson (Glasgow) having quoted authority for

the purpose of proving that there is no longer any contagious disease among the cattle of the Dominion, called on the new Minister for Agriculture to redeem the promise given by Lord Burghclere, who, as Mr. Herbert Gardiner, held a similar position in the last Liberal Administration, that when such was shown to be the case the embargo should be withdrawn. Mr. Maxwell, President of the Scottish Co-operative Wholesale Societies, seconded the appeal in the interests of consumers, on the ground, among others, that from one-third to one-half of the Canadian cattle now slaughtered at the ports of debarkation in this country are not in the best condition for consumption as food. Mr. Thomas Kidner, representing the Norfolk Chamber of Agriculture, declared that he and other farmers in that county would feed half as many cattle again as they fed now but for the prohibitive price of the Irish stores, on which they had mainly to depend. If Canadian cattle were allowed to remain alive in this country for some time, not only would graziers and consumers get a better return for their money but the strains of cattle throughout the United Kingdom would be improved by the introduction of the best Canadian blood. Brickwood expressed the views of Southampton and the surrounding district.

In the course of his reply, Lord Carrington said that it must be admitted on Imperial as well as on sanitary grounds that the advocates of the repeal of the Act of 1896 would seem to have a strong case, but on the other hand it was useless

to deny that there was an overwhelming mass of opinion that the law could not safely be altered on account of the grave risk of the introduction of disease that would be run by the tenant farmers and small occupiers of the United Kingdom. He did not admit, he continued, that the restrictions were imposed to keep up the price of store cattle in this country. If that were so, it would be difficult, and, in fact, impossible, for the present Government to countenance what would mean Protection. The real objection to the removal of the restriction was the fear that we might suddenly find ourselves face to face with an alarming outbreak of foot-and-mouth disease or pleuro-pneumonia. He was sure that the deputation would recognise the fact that in the middle of the hurly-burly of a General Election it would be highly improper for him to announce the final decision of the Government on a matter of such great national importance.

The Royal Commission appointed to inquire into the conditions

The Supply of Food in Time of War.

affecting the importation of food and raw material into the United Kingdom in time of war has issued its Report (Cd. 2643, 2644, and

2645—1905). By the terms of reference, the Commission was required to inquire into the conditions affecting the importation of food and raw material into the United Kingdom in time of war, and into the amount of the reserves of such supplies existing in the country at any given period; and to advise whether it might be desirable to adopt any measures in addition to the maintenance of a strong fleet, by which such supplies could be better secured and violent fluctuations avoided. The report, considered as a whole, is calculated to lessen anxiety as to the subject matter of the inquiry and there are no recommendations for drastic changes for better securing the national position.

The report is signed by all the Commissioners, but the main report is supplemented by reports and memoranda, some of which are in fact minority reports. The main report considers the various plans put before the Commission for establishing in one form or another State stores of grain, but rejects them on the ground of the economic and other disadvantages which seem to attend them.

A matter of fundamental importance to the inquiry was the extent of food stuffs, or rather bread stuffs, existing in the United Kingdom at the time of the year when stocks are lowest. On this point the Commissioners state: -We think we are justified in saying that, having regard to all the facts put before us, it is safe to assume that the stock of wheat within the United Kingdom, which usually represents about 17 weeks' supply in September, will not fall below 7 weeks' supply. except in the month of August, when it might be 61 weeks'. The minimum could only occur in the unlikely contingency of first hand, second hand, and farmers' stocks being at their lowest point at the same time, and even under these circumstances this result could only be reached in the period from June to August, when the home-grown crop is to a large extent exhausted. We do not think it likely that at any given time the stock will actually be at the minimum above-mentioned. We have put this calculation forward as the worst that we think it necessary to take into account, and we think it a fair deduction from the facts and figures we have brought together to say that our stock of wheat will seldom fall so low as seven weeks' supply.

The Commissioners also state that :—We think that the effect of the naval and shipping evidence is conclusive as to the point that while

there will be some interference with trade and some captures, not only is there no risk of a total cessation of our supplies, but no reasonable probability of serious interference with them, and that, even during a maritime war, there will be no material diminution in their volume, unless in the case of a great naval disaster.

The report for

Salmon and
Freshwater Fisheries
of England and
Wales.

the year 1904 (Cd. 2671-1906) of the proceedings under the Salmon and Freshwater Fisheries Acts has just been issued. Judging from the information supplied the past fishing season was moderately successful, but not so generally satisfactory as the preceding one. The rivers Teify, Towy, Wye, Severn, Dart and Exe show a considerable

improvement, but the Lune, Tees, and Tyne show a falling off. The Eden, Dee, Usk, Taw, Torridge, and other rivers possessing great possibilities show no change. The returns show a very considerable increase in the quantity of salmon from England and Wales sold in Billingsgate Market in 1904, as compared with any year of which returns have been kept. From figures supplied by the Fishmongers' Company, it appears that during the season of 1904, the average price of English and Welsh salmon sold at Billingsgate Market was 1s.  $7\frac{1}{2}d$ . per pound, as compared with 1s.  $5\frac{1}{2}d$ . in 1903, and 1s. 8d. in 1902; while the average price of British and Irish fish together was just over 1s.  $6\frac{1}{2}d$ . per lb., or 1d. more than in 1903.

Mr. Consul Liddell in his report (Cd. 2683-2-1905) on the industry of the Lyons Consular district gives the

The Cement Industry in South-Eastern France. of the Lyons Consular district gives the following particulars of the cement-making industry. The centre of the cement trade of this Consular district is Grenoble. The total annual production of the Department

of Isère is about 180,000 tons. The Department of the Ain produces

100,000 tons; the Departments of Savoie and Haute Savoie conjointly about 30,000 tons. There is, besides, a small production in the Jura.

Argillaceous and calcarcous strata are found in the neighbour-hood of Grenoble. Fuel, which enters largely into the cost of manufacture of cement, is provided by the anthracite mines of Lamure in close proximity to Grenoble, and a cheap and plentiful supply is always available. Rotary kilns, however, cannot be used, as the Lamure anthracite does not contain the necessary amount of gas, and produces abundant ash in combustion. Water power is easily obtainable, and about 3,000 horse-power are now used for the manufacture of cement in the Department of the Isère. The amount of coal used is about 35,000 tons at 16s. per ton. The cost of labour is estimated at 60,000%. per annum.

In 1885 the cement produced in the Grenoble district amounted to 175,000 tons of all qualities, averaging from 16s. to 2l. 8s. per ton, representing a value of 320,000l. and employing 1,250 hands.

To-day the cement industry is represented in the Department of the Isère by nine firms, employing 1,500 workmen, producing 180,000 tons, of which 135,000 tons are for home consumption, and 45,000 tons or 25 per cent. for export  $vi\hat{a}$  Belfort, Vallorbes, Geneva, Modane and Marseilles. The sale price at works varies from 12s. to 1l. 16s. per ton.

Whereas the price of fuel used in the manufacture of cement has increased of late years and labour has become dearer, the sale prices of Grenoble cement tend to decrease. This has been brought about firstly because heavy goods of this nature cannot profitably be charged with the cost of transport over 200 miles in a district where the absence of canals gives a monopoly to the railways, and consequently high freight tariffs are charged; secondly, because cement works have been started in many other parts of France; and lastly because the export of cement to Italy, Switzerland and the Mediterranean is daily decreasing. There are now cement factories in Algeria, Tunis, and Egypt, and excessive customs rates in Italy and Switzerland have killed the trade; twenty years ago half the tonnage of the Grenoble annual output found its way to the Mediterranean, Italy, and Switzerland.

One hundred and nineteen creameries participated in the Surprise

Surprise Butter Competitions, 1905.

Butter Competitions conducted by the Department in 1905:\* Six competitions were held during the year, particulars of which are set forth in the following table:—

		Number	Number of Prizes Awnrded.	
Telegrams Issued.	Exhibits Judged.	of Entries.	First Class	Second Class.
25th May, 1905,	2nd June, 1905,	117	4	14
28th June, 19 6,	6th July, 1905,	112	9	11
20th July, 1905,	27th July, 1905,	108	6	8
3rd August, 1905,	10th August, 1905,	114	5	10 .
14th September, 1905,	21st September, 1905,	108	6	16
26th September, 1905,	5th October, 1905,	105	5	10

The following creameries obtained prizes at four of the competitions:—Bansha C. A. and D. S., Centenary Creamery Co., Doons C. A. and D. S., Longford C. A. and D. S., Solohead C. A, and D. S.

The following obtained prizes at three of the competitions:—Ballintrillick C. A. and D. S., Ballyrashane C. A. and D. S., Castle-caulfield C. A. and D. S., Finn Valley C. A. and D. S., Grantstown C. W. S., Kilmallock Creamery Co., Kiltoghert C. A. and D. S., Newmarket Creamery (Newmarket Dairy Co.).

The following obtained prizes at two of the competitions:—Ardagh C. D. S., Bride Valley (Newmarket Dairy Co.), Clouncagh C. D. S., Derrygonnelly C. D. S., Glenwilliam C. D. S., Granagh C. D. S., Howardstown Dairy Co., Killasnett C. A. and D. S., Killen C. D. S., Knockulty (Newmarket Dairy Co.), Mitchelstown (Newmarket Dairy Co.), Newcastle West C. A. and D. S., Omagh C. A. and D. S., Piltown C. A. and D. S., Scottish C. W. S., Enniskillen, Shaneragh C. A. and D. S.

The following obtained a prize at one of the competitions:—Ballinahinch C. W. S., Ballinamore C. A. and D. S., Ballybricken C. W. S., Belleek C. A. and D. S., Bunkay Bridge C. W. S., Castlecor Dairy Co., Drumclough C. W. S., Dromore C. A. and D. S., Dromore C. A. and D. S., Dromholm C. A. and D. S., Drumquin Creamery, Fealebridge C. W. S., Freemount Dairy Co., Granard C. D. S.,

<sup>\*</sup> Journal, Vol. V., No. 3. p. 536.

Greenane C. W. S., Greencastle C. A. and D. S., Inver C. A. and D. S., Irvinestown C. A and D. S., Killyman C. A. and D. S., Leckpatrick C. A. and D. S., Lissarda C. D. S., Monagea C. A. and D. S., Moneymore C, A. and D. S., Muckalee C. A. and D. S., North Kerry Creamery Co., Pomeroy C. A. and D. S., Rathkenny C. A. and D. S., Spamount C. A. and D. S., Springfield C. A. and D. S.

In addition to the prizes given at each competition, a sum of £26 was awarded in the form of special prizes to the managers and dairy-maids in the undermentioned creameries which scored the highest number of marks during the season:—

	Marks Obtained.	Per- centage of Max.	Special Prize Awarded.	
<del></del>	(Max. 2,400.)		To Manager.	To Dairy- maid.
Bolohead C. A. & D. S., Ballyrashane C. A. & D. S., Centenary Co-operative Creamery,	2,212	92·20 92·16 92·08	£ 10 6 4	£ 3 2

The following creameries scored 91 per cent. of the maximum marks obtainable at the six competitions:—

Marks Obtained. (Max., 2,400.)	Percentage of Max.
 2,205	91.87
 2,190	91-25
 2,188	91 16
 2,186	91.08
 2,184	91.00
	2,205 2,190 2,188 2,186

The judges at the competitions included representatives of the principal buyers of Irish butter in Great Britain, as well as of Cork, Limerick, and Belfast. Four judges, representing different markets, acted at each competition. A high standard, based on the quality

The Judges and Judging.

of the best butter sold in the markets of Ireland and Great Britain was adopted in judging. On the occasion of each of the first five

On the occasion of each of the first five competitions held in the year, a limited

number of Managers of Creameries registered under the Department's scheme for improvement in the management of creameries,

were admitted to view the exhibits, after the judging had been completed. The judges directed the attention of the Managers to any pronounced defects which might have been noticeable, and subsequently the exhibits were examined in detail by the Managers, under the directions of one of the Department's Inspectors.

The reports furnished to the Department by the judges at this

Quality of the Butter. year's competitions express considerable satisfaction with the quality of the exhibits at the competitions held in October, September, August, and early in July. At

these competitions only a few exhibits were considered of inferior quality, the majority being of good average quality, while some exhibits might be classed as excellent. The exhibits, however, at the competition held on the 27th July, and to a lesser extent at the competition held on the 2nd June, failed to show as satisfactory a standard as might be expected, the principal defects being\*(1) a soft and too moist texture, and (2) a tendency to a fishy, oily, or greasy flavour, which was probably accentuated by the damp hot weather prevailing at the time the competition was held. and "sponginess" in texture is a fault to which several of the judges this year, as well as in 1904 and 1903, drew attention, and while one of the judges, who has acted one or more times each year since the inception of the competitions, considers an improvement noticeable in the body and texture of the butter generally, it is apparent that the remedying of this defect in texture is a matter which requires careful attention on the part of creamery managers. percentage of exhibits, consisting mainly of kiels and kegs of butter,

Moulds on Butter. showed traces of mould this year. The mould in most cases had developed on the top or bottom of the exhibit where it came in contact with the lid or bottom piece of the

package. This frequently indicates the use of unseasoned timber in the construction of lids and bottom pieces of kiels and kegs. Although not in itself necessarily productive of moulds, the causes of which are explained in the Department's Journal (Vol. V., No. 2, p. 320), unseasoned beechwood in contact with the damp parchment paper would certainly facilitate the propagation of moulds when the seeds or "spores" are already present. Improvement is still to be looked for in the packages used for butter. The Department's Leaflet No. 60, "The Packing of Butter," contains particulars of the recommendations of the Department in this matter.

#### LOCAL SCIENCE AND ART EXAMINATIONS, 1905.

#### Examination Centres.

(Note.—F. = Freehand Drawing of Ornament in Outline; L. = Drawing in Light and Shade from a cast; M. = Model Drawing; G-D. = Geometrical Drawing (Art); P. = Perspective; P.-F. = Memory Drawing of Plant Form; B.-B. = Drawing on the Blackboard. Science Subjects are designated by the numbers given them in "Syllabuses and Lists of Apparatus" of the Board of Education for 1905-6.)

EVENING EXAMINATIONS AND EXAMINATIONS IN DRAWING ON THE BLACKBOARD.

Centre	Name of Contra	Subjects in which Examinations were held.		
Number.	Name of Centre.	Science.	Art.	
· .	LEINSTER.			
	Co. Carlow-			
6247	Bagenalstown: Presentation Convent.	_	L., PF., BB., and Design.	
6260	Carlow: Convent of Mercy, .	_	F., L., M., GD., PF., BB., and Design.	
6356	Tullow: Brigidine Convent, .	Subjects XIV. and XXV.	F., M., GD., BB., and Design.	
6107	Tullow: St. Patrick's Seminary.	_	F., L., M., GD., and Design.	
	Co. DUBLIN-	•	•	
6248	Blackrock Municipal Technical School.	Bublects I., III., IX., XIV., and XXV.	-	
6262	Chapelized: Mount Sackville Convent.	<b>~</b> - ,	F., GD., and M.	
6163	Kingstown: Municipal Technical School.	Subjects I. and III.,,	F.	
	Co. BOROUGH OF DUBLIN:			
6143	Christian Brothers' Novitiate, Marino, Clontarf.	_	F., L., M., GD., BB., and Design.	
6647	Church Home School, Clyde- road.		F., and Design,	
6010	City of Dublin Technical Schools.	Subjects I., II., III., V. (Div. I.), Vp., VIA., VII., VIII.	F., L., M., GD., BB., and Design.	
	· .	V. (Div. I.). Vp., VIA., VII., VIII., IX., X. Xp. (Stage 1), Xp. (Stages 2 and 3), XI., XXII, and XXIII.		
6065	Loreto College, Stephen's Green,	_	BB., and Design.	
	•	1	9 R	

Centre	Name of Centre.	Subjects in which Ex	aminations were held.
Number.	Name of Centre.	Science.	Art.
6019	CO. BOROUGH OF DUBLIN—con.  Metropolitan School of Art,  .	Subjects Ljand III., .	F., L., M., GD., P., PFBBAnatomy, Architecture, Architecture, Architectural Design, Design, Drawing from the Antique, Drawing of Common Objects from Memory, Drawing from Life, Drawing the Antique from Memory, Historie Ornament, Modelling Design (Honours), Modelling from Life, Modelling from Life, Modelling from the Antique, Modelling from Life, Painting orn Still Life, Painting orn S
6035	Itoyal College of Science,	Subjects I., II., V. (Divn. I.), VIB., VII., VIII., IX., X., XIXp. (Stage 3), and XXII.	Historic Ornament.
	CO. KILDARE-		
6217	Athy Christian Brothers'		L., BB., and Design.
6468	Schools. Kildare: Technical School, .	<b>-</b> ′	F. and GD.
6442	Naas: Technical School,	-	F., L., and Design.
	Co. Kilkenny-		
6607A	Kilkenny: Model School,	-	F., L., M., and Design.
6607	Kilkenny: Technical School, .	Subjects X., Xp. (Stage 1), and XXIII.	GD.
6416	Co. LOUTH— Drogheda: Municipal Technical School.	Subjects I., III., V. (Divn. I.), and	L., GD., B.B , M., and Design.
6350	Dundalk : Convent of Mercy, .	XXII.	F.
6415	Dundalk : Municipal Technical School.	Subjects II., III., V. (Divn. I.), VIA., VIB., VII., IX., and XXII.	L., M., BB., and Design.
6415A	Dundalk : Town Hall,	Subject L,	G <b>D</b> .
	Co. MEATH-		
6568	Navan: Loretto Abbey,	-	PF.
	Queen's County-		1
6310	Abbeyleix: Brigidine Convent,	_	GD. and Design.
6359	Mountrath: Brigidine Convent,	-	L.
	Co. Westmeath.		
6311	Athlone: La Sainte Union Convent.	<b></b>	в.в.

Centre	Name of Centre.	Subjects in which Examinations were held.		
Number.	Name of Centre.	Science.	Art.	
	Co. Wexford-			
6249 6606	Enniscorthy: Loreto Convent, New Ross: Convent of Mercy,	Ξ	BB. and Design. F., L., M., GD., BB., and Design.	
6732	Newtownbarry: St. Mary's Convent.	-	ВВ.	
6347	Wexford: Municipal Techni- cal Institute.	Subjects III., IX., X., and $Xp$ . (Stage 2).	F., L., M., GD., BB., and Design.	
	Co. Wicklow-			
6697	Arklow: Technical School, .	Subjects III. and XX.		
6715	Graystones: Technical School,	Subject III.	<del>-</del> .	
	MUNSTER. Co. Cork—			
6603	Bandon: Technical School, .		F.	
6012	Blackrock: Ursuline Convent,	_	F., M., GD. and De-	
6667	Clonakilty: Technical School,	· _ •	sign. F. and L.	
6061	Dunmanway, St. Mary's	-	ВВ.	
6308	School. Fermoy: Loretto Convent, .	_	F. M., GD., and	
6751	Fermoy: Technical School, .	_	Design. F. and GD.	
6013	Kinsale: Convent of Mercy, .	_	F., L., M.,, GD., P., PF., BB., and De- sign.	
6615 6569	Kinsale: Technical School, Macroom: Convent of Mercy, .	Subject III.,	BB.	
6659	Macroom: Technical School, .	Subject III.,	F., L., M. and GD.	
6131	Midleton: Christian Brothers' Schools.	_	F., L., M., GD., and Design.	
6581	Queenstown: Convent of Mercy.		B-B., and Design.	
6081	Queenstown: Presentation Brothers' College.	Subjects II., III., IV.,	-	
670 <u>4</u>	Rushbrooke: Convent of Mercy.	and Vp. Subject XXV.,	_	
6802 6328	Skibbereen: Technical School, Youghal: Christian Brothers' Schools.		F., M., and G.D. Design.	
6434	Youghal: Presentation Convent.		F., L., GD., and Design.	
ł	CO. BOROUGH OF CORK-			
6003	Ohristian Brothers' Schools, Our Lady's Mount. Orswford Municipal Techni- cal Institute.	Subjects X., Xp., (Stage 2), and XI. Subjects I., III, III., IV., Vp., VII., VIII., IX., X., Xp. (Stage 1), Xp. (Stage 2), XI., XIp. (Stage 2), XVII., and XXII.	F. L. M., GD., BB., and Design. F. L. M., GD., P., PF., BB., Design, Drawing of Common Objects from Memory, Drawing from Life, Drawing from the Antique, Historic Ornament, Modelling from Life, Painting from Still Life, Painting from Still Life, Painting Ornament, and Principles of Ornament	

354

Centre Name of Contro		Subjects in which Ex	aminations were held.
Number.	Name of Centre.	Science.	Art.
	CO. BOROUGH OF CORK-con.		
6320	Presentation Brothers' Mon-	_	BB. and Design.
6057	astery, Mount St. Joseph. St. Aloysius' School, St. Marie's		вв.
6024	of the Isle. St. Vincent's Convent, St. Mary's-road.	-	Modelling [from the Antique.
	CO. KERRY—		,
6048	Killarney: Loreto Convent, .		BB. and Design.
6680	Killarney: Technical School, .	-	F., L., and M.
6678	Listowel: Technical School, .	Subject III.,	F.
6571	Tralee: Central Technical	Subjects II. and III.	F., M., and GD.
6068	School. Tralee: Presentation Convent,		ВВ.
	Co. Borough of Limerick-		
6039B	Athenœum Hall, Cecil-street,	Subject IX.,	F. and Drawing of Common Objects
6160	Christian Brothers' Schools, Sexton-street.	-	from Memory. F., L., M. GD., BB., and Design.
6039	Municipal Science, Art, and Technical School, 69 George- street, Limerick.	Subjects II., III., Vp., VII., Xp. (Stage 1), Xp. (Stage 2), XI, and XIp. (Stage 1), Subject X.,	<del>-</del>
6039A	School of Art, Cecil-street, .	and X1p. (Stage 1), Subject X.,	L., M., GD., P., P.F., B.B., and Design.
	Co. TIPPEBARY—		
6147	Cashel: Presentation Convent,		F., L., P., PF., and
6556	Clonmel: Central Technical School.	Subject III.,	Design. BB. and Design.
6148	Thurles: Presentation Con-	_	PF. and Design.
6069	vent. Thurles: Ursuline Convent	Subject V, (Divn. I).	F.
6183	Tipperary: Christian Brothers' Schools.	Subject III.,	F.
	Co. Borough of Water- FORD-		
6118	Christian Brothers' Schools, Mount Sion.	Subjects III., IX., and X.	F. L., M., GD., BB., P., Design, and Drawing of Com- mon Objects from
6064	Convent of the Ground Heart	_ •	Memory. F., M., and GD.
6084 6100	Convent of the Sacred Heart of Mary, Ferrybank. St. Anne's High School, Ursu-		1
0100	line Convent.	_	F., L., M., GD., BB., and Design.
1	ULSTER.		
	Co. Antrim-		
6358	Ballymena: Municipal Technical School.	Subjects I., II., VII., IX., X., Xp. (Stage 1), and XXII.	F., M., P.F., BB., Design, and Painting from Still Life.
6244	Ballymoney: Intermediate School.	I, shill AAII.	F., L., M., GD., and Design.

Centre	N	Subjects in which Ex	aminations were held.
Number.	Name of Centre.	Science.	Art.
	Co. Antrim-con.		
6232A	Larne: Female National School,	Subjects I., III., V. (Divn. I.), VIII., IX., XIV., XXII., and XXV.	F., M., and BB.,
6199	Larne: Grammar School, .	Subjects X. and $Xp$ ., (Stage 1).	_
6028	Lisburn: Convent of the Sacred Heart of Mary.	-	BB., and Design.
6114	Lisburn: Ulster Provincial School.	Subjects V., X., $Xp$ . (Stage 1). and $Xp$ . (Stage 2).	F., M., and Design.
	Co. Borough of Belfast-		
6227	Municipal Technical Institute, College Square, North.	Subjects V. (Divn. I.), V. (Divn. II.), Vp., VII., IX., XI., XIV., XVII., XXII., XXIII., and XXV.	<del>-</del>
62270	Queen's College,	and Xp. (Stages 2	_
<b>6227</b> ∧	School of Art, North-street, .	Subjects I., IV., VIA., VIB., VIII., VIIIA., VIII., VIIIA., VIIII., VIII., XII., and XX.	F., L., M., GD., P., PF., BB. Anatomy, Architecture, Architectural Design, Design, Design, Drawing from Memory. Drawing from Life, Drawing from Memory. Historic Ornament, Modelling Design (Stage 2), Modelling from Life, Modelling from Life, Modelling from Life, Andique from Life, Painting from Still Life, Painting Ornament, and Principles of Ornament.
<b>6227</b> B	Working Men's Institute,	Subjects II., III., X., XIp. (Stage 1), and XIp. (Stage 2).	,
6038	Co. ARMAGH— Armagh: Natural History and	_	F., L., and M.
	Philosophical Society's New Art Rooms, the Mall.		
6433	Lurgan: Convent of Our Lady of Mercy.	-	F. L. M., GD., PF., BB., Design, Draw- ing of Common Ob- jects from Memory, and Historic Orna- ment.
6867	Lurgan: Municipal Technical School.	Subject III., V. (Divn. I.). VIA., IX., and XXIII.	F., L., M., and Design.
6574	Portadown: Municipal Tech- nical School.	Subject III.	F.
	Co. Down-		
6582	Banbridge: Technical School, .	Subject V. (Divn. I.), and IX.	F., M. and GD.
6687 6579	Bangor: Technical School, Holywood: Technical School,	Subject III., Subjects V. (Divn. I.), X., Xp. (Stage 1), and Xp. (Stage 2).	F., L., M., and Design. F., M., and G.D.
			4.

Centre	Name of Centre.	Subjects in which Ex	aminations were held.
Number.	Name of Centre.	Science.	Art.
6544	Co. DOWN—con.  Newry: Municipal Technical School.	Subjects I., III., Vp., IX., X., Xp. (Stage 1), XV., XXII., and	F., L., M., GD., P., PF., BB., Design, and Painting from
6092	Newry: St. Colman's College,	1), XV., XXII., and XXIII. Subjects V. (Divn. I.), VIA., VIB., VIII., IX. and X.	Still Life.
6645	Newtownards: Technical School.	IX. and X. Subjects II. and III.	F., and M.
	Co. Fermanagh-		
6372	Enniskillen. Convent of Mercy,		BB., and Design.
	Co. Londonderry-		
6235	Co. BOROUGH OF LONDON-	Subjects I., V. (Divn. I.), Vp., VIA., VIB., VII., VIII., VIIIB., VIIIC., IX., and X.	F., L., M., GD., and Design.
6549	DERRY-		GD. and Design.
6037	Londonderry: Convent of Our Lady of Mercy.	Cubiasta I II III	-
6087	Londonderry: Municipal Technical School.	Subjects I., II., III., V. (Divn. I.), Vp., VIA., VIB., VIII., and IX.	F., L., M., GD., P., PF., BB., Ana- tomy, Design, Model- ling Design (Stage 2), Modelling from the Antique, Paint- ing Ornament, and Principles of Orna-
6109	Londonderry: Strand House School.	Subjects X. and $Xp$ . (Stage 1).	ment. F.
6225	CO. MONAGHAN— Monaghan: St. Louis Convent,	_	F., L., M., GD., and Design.
6701 6581 6707	Co. Tyrone— Cookstown: Technical School, Dungannon: Technical School, Omagh: Urban Council Rooms.	=	F., M., and Design. F., GD., and Design. F., GD., M., and
-6708A	Strabane: Bridge End School,	_	Design. F., M., and GD.
6066	CONNAUGHT. Co. GALWAY— City of Galway Technical	Subjects I. III., V.	
	Institute.	Subjects I., III., V., (Divn. I.), V. (Divn. II.), VIA., VIII., V. (Stage 2), XI., Xp. (Stage 1), Ap. (Stage 1), and XXIII.	F., L., M., GD., P., PF., BB., Design, and Painting Orns- ment.
6067	Galway: Dominican Convent, Taylor's-hill.	Subjects V. (Divn. I.), VIIL and X.	F., L., M., GD., and Design.
	Co. MAYO-	-	
6202	Kiltimagh: St. Louis Convent,	-	L. and Design.
	Co. SLIGO-		
6197	Sligo: Ursuline Convent, .	-	F., L., M., P., and Modelling from the
6765	Sligo: Municipal Technical School.	Subjects I., III., and	Antique. F., L., and M.

### DAY EXAMINATIONS.

Centre	Y 4 G	Subjects in which Exc	aminations were held.
Number.	Name of Centre-	Science.	Art.
	LEINSTER.		
	Co. CARLOW-		
6247	Bagenalstown: Presentation Convent.	Subjects XIV. and XXV.	F., M., and GD.
6260	Carlow: Convent of Mercy,	_	F., L., M., and GD.
6356	Tullow: Brigidine Convent	_	F., M., and GD.
	Co. DUBLIN-		
6728	Rathgar: School,		F., and GD.
	Co. Borough of Dublin-		
6143	Dublin: Christian Brothers' Novitiate, Marino, Clontarf.	_	F., M., and GD.
6847	Church Home School, Clyde- road.	Subject XVII., .	_
6065	Loreto College, St. Stephen's- green.	_	F.
6035	Royal College of Science, .	Subject IX.,	_
	Co. Kilkenny		
6458	Goreshridge: Brigidine Convent.		F., L., M., and GD.
	Co. Louth-		
6416	Drogheda: Municipal Techni- cal School.	Subject V. (Divn. I.),	-
6120	Drogheda: Sienna Convent, .	-	F., L., M., and GD.
	CO. MEATH-		~
6558	Navan: Loretto Abbey, .	_	F., M., and GD.
	Queen's County-		
6310	Abbeyleix: Brigidine Convent,	-	F. and M.
6356	Mountrath: Brigidine Convent.	-	F.
	Co. Westmeath-		
6536	Mullingar: Loretto Convent, .		F. and GD.
	Co. WEXFORD-		
6249	Enniscorthy: Loreto Convent,		F., M., and GD.
	munster.		
	Co. Clare-		
6063	Ennis : St. Mary's School, Con-	<b>-</b> .	F., L., M., and GD.
6105	vent of Mercy.  Kilmihil: Cahirmurphy National School.	Subject V.( Divn. I.),	
	National School.		

358

## DAY EXAMINATIONS-continued.

Centre		Subjects in which Examinations were held.		
Number		Science.	Art.	
	Co. Cork-			
6145	Charleville: St. Joseph's Con-		F., M., and GD.	
6064	vent of Mercy. Dunmanway: St. Mary's School.	_	F., L., M., G.D., and	
6569	Macroom: Convent of Mercy,	_	L. and M.	
	Co. BOROUGH OF CORK-		·	
6003	Crawford Municipal Technical	-	GD. and P.	
<b>63</b> 20	Institute. Presentation Brothers' Monas-	_	F., L., M., and G.D.	
6057	tery, Mount St. Joseph- St. Aloysius' School, St.	_	F., L., GD., and P.	
6024	Marie's of the Isle. St. Vincent's Convent, St. Mary's-road.	Subject V. (Divn. I.),	F., L., and GD.	
	Co. Kerry			
6048	Killarney: Loreto Convent,		F., L., M., and GD.	
6068	Tralce: Presentation Con- vent.		F., L., and M.	
	Co. Tipperary—			
6147	Cashel: Presentation Convent,		F., L., M., and GD.	
6556	Clonmel: Central Technical	_	F., L., M., GD., and	
6148	Schools. Thurles: Presentation Convent,	-	м.	
	CO. WATERFORD-			
6070	Waterford: Municipal School of Art.		F., L., M., GD., and P.	
	ULSTER.			
	CO. ANTRIM-			
6358	Ballymona: Municipal Techni-	- 1	F., L., M., and GD.	
6028	cal School. Lisburn: Convent of the Sacred Heart of Mary.	_	L.	
	Co. FERMANAGH-		·	
6372	Enniskillen : Convent of Mercy,	-	Li,	
	CONNAUGHT.		•	
	Co. GALWAY-			
6596	Ballinasloe: Technical School,	-	F. and GD.	

# LOCAL SCIENCE AND ART EXAMINATIONS (IRELAND). May and June, 1905.

## Summaries of Results.

Year.	Number of Passes.		Number of Failures.	Percentage of Passes.		
1905	6,013	3,495	2,518	58.12		
1904	5,992	3,344	2,578	56.47		
1963	4,894	2,662	2,232	54:39		
1902	4,380	2,390	2,061	52.94		
1901	4,018	· 2,184	1,829	54.42		

		Number Examined.	Number of Passes.	Number of Failures.	Percentage of Passes.
·	(Derr	37	26	11	70-27
Science Examinations	$\int$ Day, . $\left\{ \right.$	121	55	66	45*45
Evening		1,876	1,192	684	63.24
	(Evening, {	1,656	1,016	64 <b>0</b>	61.32
		1,913	1,218	695	63 67
		I,777	1,071	706	60.27
	(Da-	525	275	250	52.38
A 4 Th	$\int^{\mathbf{Day}},$ .	593	337	<b>4</b> 56	56.83
Art Examinations,	77	3,575	2,002	1,573	<i>5</i> 6·00
	(Evening,	3,552	1,936	1,616	54.20
		4,100	2,277	1,823	55.54
		4,145	2,273	1,872	54 84

	1905	72,522	49,043	23,479	67:63
	1904	77,277	50,516	26,761	65:37
Science (Day and Evening),	1903	76,013	49,308	26,705	64.86
	1902	80,651	48,525	32,126	60:16
•	1901	99,790	65,913	33,877	66 05
	1905	72,586	42,628	29,958	58.73
	1904	88,081	58,340	84,741	60.56
Art (Day and Evening)	1903	89,992	52,445	37,547	58-27
	1902	94,780	56,099	38,681	59:18
	1901	111,955	59,251	52,704	52.92
	1905	145,108	91,671	53,437	63-17
	1904	165,358	103,856	61,502	62.81
Totals,	1903	166,005	101,753	64,252	61-29
	1902	175,431	104,624	70,807	59-63
	1901	211,745	125,164	86,581	59:11
					1.

360

## Science Examinations (IRELAND)—Evening.

	Ę	tage	1.	8	tage	2.	8	tage	<b>3.</b>	B	onou	76.
Subject.		1st Class.	2nd Class.	Number Examined.	1st Class.	2nd Class.	Number Examined.	1st Olass.	2nd Class.	Number Examined.	1st Class.	2nd Class.
I. Practical Plane and Solid S Geometry.	81 64	27	23	35 13	8	18	2	-	1	-	-	-
II. Machine Construction and f	112	37	44	46	7 2	20	7 8	1	4	1	-	-
III. Building Construction, .	115	33 61	39	72	12	84	26	8	14	4	-	-
IV. Naval Architecture,	13	2	51	60 5	1	<sup>27</sup>	8	1	5	1	-	1
VP. Practical Mathematics,	100	25	47	5 <b>63</b>	3	23	1	-	-	-	-	-
VIA. Theoretical Mechanics (Solids),	37 28	11	8	11	-	5 6	-	-	-	}	-	
VIB. Theoretical Mechanics (Fluids)	16	7	6 2	15 9	2	4	-	-	-	-	-	-
VII. Applied Mechanics,	46	3 16	14	8 33	2	16	3	-	1	-	-	-
VIII. Sound, Light, and Heat,	57 60	23	16 19	23 -	-	. 27	7	-	-	-	-	-
VIIIA. Sound,	39	- II	-	8	-	2	-	-	-	-	-	-
VIIIB. Light,	-	-	-	4	- -	3 2	-	-	-	-	-	-
VIIIo. Heat,	-	-	-	3 8	1	3	-	-	-	-	-	-
	185	- 51	87	5 19	-	3 7	5	1	-	-	-	-
IX. Magnetism and Electricity,	1 <sub>34</sub>	17 88	44	38 50	5	16 26	9	-	4	-	-	-
X. Inorganic Chemistry,	¥44 80	51 94	57 22	42 42	3 14	21 19	11	1	-	-  -  -	-	
XP. Inorganic Chemistry (Prac- tical).	73	15	28	35	Io	14	2	-	1			

361
Science Examinations (Ireland)—Evening—continued.

	8	tage :	l. <sub>.</sub>	8	tage	2.	s	tage :	3.	н	onou	·s.
Subject.		1st Class.	2nd Class.	Number Examined.	1st Class.	Ind Class.	Number Examined.	1st Class.	2nd Class.	Number Ex amined	1st Class.	2nd Class.
XI. Organic Chemistry, $\ \ . \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	12 15	2	4 5	8	- -	8	1 -	-	1 -	]-	-	-
XIP. Organic Chemistry (Prac- {	5	3	1 3	7 -	-	1 -	- -	 -	-	<u>}</u> -	-	-
XII. Geology,	- 2	- 1	- 1	- 1	-	- -	- -	- -	<u>-</u>	1 -	-	1
XIV. Human Physiology, {	<b>21</b> 8	8 5	14	2	1	1 2	-	- -	- -		-	-
XV. General Biology, $\left\{ \begin{array}{ccc} & & & & & & & \\ & & & & & & \\ & & & & $	-	-	<u>-</u>	1 -	-	1 -		-	-		<u>-</u> -	-
XVI. Zoology,	-	- 1	-	-	-	-	-	-	-	1	-	-
XVII. Botany,	5	1	8	2	1	1	-	, -	- -		-	-
XIX. Metallurgy, {	-	-	-	-	- -	-	1	-	-	-	-	-
XX. Navigation,	5	1	2	2	2	-	1	_ _, 1	-	•	-	-
XXII. Steam,	2 50 51	2 28 10	17 29	28 19	2 2	- 16 7	- 6 5	1		-		-
XXIII. Physiography,	6	2	2	1	- 3	1	-	-	-	-	-	-
Do. (Section 1 only),	24 21	10*	-	-	-	-	-	-	-	-	-	-
XXIV. Agricultural Science and Rural { Economy.	- 31	-	,	1	-	1	-	-	•	-	-	-
Economy.	24	3	19	6	2	4	2	-	2	-	-	-
(	1,091	7 347	367	458	71	3 214	83	- 8	36	- - 7	-	-
Totals, , , {	1,081	280 281	36C	351	, 6a	151	52	2	22	4	_	-

\* Passes : only one class of success.

## SCIENCE AND ART EXAMINATIONS (IRELAND)—EVENING—continued.

				7.	н	Honours.			
Subject.	Number Ex- amined.	lst Olass.	2nd Class.	Number Ex- amined.	1st Class.	2nd Class.			
**************************************	{1, }	140	39	47	)  )				
	** }	162	26	36	11	l			
(Division L	ا و ا	54	9	21	5	-	5		
Division 1.		47	5	27	3	1	1		
	8, {	35	10	14	li .				
V. Mathematics,		19	11	8	IJ				
	<b>[5, </b> ]	3	- 1	2	6				
Division II		4	1	2	ll .				
(Division D	6, }		-	-					
	(0. 1	1	-	1	Ų				
Totals,	ſ	232	58	84	5	-	6		
Totals, .	. !	233	43	94	3	1	1		

## Science Examinations (IRELAND)-DAY.

	8	tage 1.		8	tage 2.	
Sub <b>je</b> ct.	Number Ex- amined.	1st Olase.	2nd Class.	Number Ex- amined.	1st Class.	2nd Class.
L Practical Plane and Solid Geometry,	- 1	- 1	-	٠ -	-,	-
VIB. Theoretical Mechanics (Fluids), $\cdot \Big\{$	<b>1</b>	-	1 -	-	-	-
VIII. Sound, Light, and Heat,	- 5	- 2	- :	-	-	-
IX. Magnetism and Electricity, {	5	3 -	2 1		- 1	- 1
X. Inorganic Chemistry,	- 1	-	-	_ 1 	-	1
XP. Inorganic Chemistry (Practical), . {	- 2	- I	- 1	-	-	-
XIV. Human Physiology, {	- 9	- 5:	2 '	-	-	-
XVII. Botany, ,	- 8	-	3 	. i.	-	-
XXIII. Physiography,	- -	-	- '	1	 1	-
Do. (Section L. only), .{	- 22	- 4°	-	-	-	-
XXIV. Agricultural Science and Rural {	-	-	-	- ,	-	- 3
EXV. Hygiene,	5 9	1 1	<b>3</b> 5	-	-	- s
XXVI. Elementary Science of Common Life {	- 5	1 -	1	-	-	-
Totals,	24 5e	5 14	10	1 23	- 3	1 6

Passes: only one class of success.

SCIENCE EXAMINATIONS (IRELAND)—DAY—continued.

G	Stages 1 to 7.						
Subject.	Number Examined.	1st Class.	2nd Class.				
V. Mathematics, Division I., $\left\{ \begin{array}{c} & & \\ & & \end{array} \right.$	1 2	~ ~ ~~	7 46 5 9 -	- 4 2 1	5 10 3 6 		
Totals,		.{	12 56	<b>2</b> 5	8 17		

## ART EXAMINATIONS (IRELAND)—EVENING.

SUBJECT.	Number Ex- amined.	1st Class.	2nd Class.
Freehand Drawing in Outline.	983	137	457
(	936	<sup>1</sup> 44	368
Drawing in Light and Shade from a Cast.	323	<b>3</b> 5	126
Drawing in hight and shade from a case,	298	. 299	- 131
No. 4 al Proposition	534	85	184
Model Drawing,	566	124	206
<b>7</b>	367	118	147
Drawing on the Blackboard	458	115	129
(	370	47	123
Geometrical Drawing,	371	56	107
	74	12	39
Perspective,	66	8	28
	25	4	8
Drawing of Common Objects from Memory,	42	4	8.
	127	7	76
Memory Drawing of Plant Form,	121	15	79
	35	12	15
Drawing from the Antique,	36	. I4	18

364
ARTS EXAMINATIONS (IRELAND)—EVENING—continued.

SUBJECT				Number Ex. amined.	1st Class.	2nd Class.
Drawing the Antique from M	emorv.		. {	16	. 3	1
	·	•	.,	15	4	2
Drawing from Life,				37	4	6
	•	·	- (	35	4	. 5
Anatomy,			. {	15	1	6
		•	- '\	23	I	12
Painting Ornament,				44	1	22
	•	•	- 1	23	· -	15
Painting from Still Life, .				43	11	12
	•	•	()	41	IO.	24
Principles of Ornament, .			5	56	7	23
1111101pion of Orlandons,	•	•	. ()	65	2	23
Historic Ornament,			5	13	2	8
THEOLIO CHAMMON,	•	•	. (	14	2	7
Architecture,		•	S	5	-	1
Aronnecture,	•	•	. []	11	2	1
Auchitentumal Design			(	3	·-	-
Architectural Design,	•	•	.{	3	-	-
m			d	<b>36</b> 8	41	174
Design, Stage 1,	•	•	•{	304	42	167
				65	10	20
Design, Stage 2,	•	•	•{	50	1	9
			d	7	2	_ ]
Design, Honours,		•	.{	5	-	
				7	2	1
Modelling the Head from Life,	•	•	·}]	6	3	
				11	1	1
Modelling from Life,	•	•	.}	ıı		: 1
				81	1	
Modelling from the Antique, .	•	•	}	32		7
				13	6	í
Modelling Design, Stage 2, .	•	•	• }	18	3	3
				3		
Modelling Design, Honours,	•	•.	• {	1	-	-
			- (	8,675	549	1,463
Totals,	•	•	· { ]	3,552	585	1,352
			1			

## ART EXAMINATION (IRELAND)-DAY.

<b>8</b> 0	BJ <b>E</b> C	Number Ex- amined.	ist Olass.	2nd Class.				
Freehand Drawing in C	utline	9,		•	.{	<b>204</b> 220	<b>27</b> 28	85 98
Drawing in Light and S	hade :	from a	Cast,	•	-{	6 <del>4</del> 72	6 4	• 20 25
Model Drawing, .	•	•		•	.{	149 141	28 53	52 46
Geometrical Drawing,		•		•	-{	96 138	11 20	86 49
Perspective, .	•	•			.{	12 22	1 - 2	9 12
Totals,			•		.{	525 593	73 107	202 230

# EXAMINATIONS IN SUBJECTS OF TECHNOLOGY (IRELAND), 1905.

## Summaries of Results.

YEAR.	Number of Registered Classes.	Number of Students attending Classes.	Number of Candidates Examined.	Number of Candidates Passed.	Number of Prizes.
1905	157	2,421	713	383	6
1904	163	2,499	722	362	13
1903	160	2,382	544	269 .	<b>.</b> 9
1902	75	1,549	395	177	3
1901	61	789	289	105	-

#### (The corresponding figures for the Examinations of 1904 are given in Old Style).

No. of School	Place.	No. of Regis- tered Classes.	No. of Students attending Classes.	No. of Candi- dates Ex- amined.	No. of Candi- dates Passed.	No. of Prizes.
6697	Arklow: Technical School, . {	<u>1</u> -	10 -	-	<del>-</del>	-
6038	Armagh: Municipal Tech-{	3 5	51 78	- 8	ī	-
6384	Ballina: Technical School, . {	- 1	- 14	-	-	-
6358	Ballymena: Municipal Tech-	2 *	20 17	7 7	4 2	- '
8008	Bandon: Technical School, . {	-	-		3	<u>-</u>

## Examinations in Surjects of Technology (Ireland), 1905-con.

(The corresponding figures for the Examinations of 1904 are given in Old Style).

No. of School	PLACE.	No. of Regis- tered Classes.	No. of Students attending Classes.	No. of Candi- dates Ex- ammed.	No. of Candi- dates Passed.	No. of Prizes.
6227	Belfast: Municipal Technical { Institute.	32 27	622 540	255 242	170 153	6 6
6248	Blackrock: Municipal Tech-inical School.	7 5	<b>117</b> 99	-	=	
6457	Bray Technical School, . {	- 3	- 56	~7	- 5	-
6101	Carrick-on-Suir: Christian { Brothers School.	=	=	-1	_1 _	-
6556	Clonmel: Central Technical {	_1	3 -	_4_	3 -	-
6235	Coleraine: Technical School, {	-	-	2 -	2 -	-
6003	Cork: Crawford Municipal { Technical Institute.	13 1 <sub>2</sub>	181 114	<b>92</b> 57	53 39 .	5
6416	Drogheda: Municipal Tech- {	<b>4</b> 4	65 77	2 13	-	-
6010	Dublin: City of Dublin Tech-	40 37	569 581	182 199	63 82	-
6415	Dundalk: Municipal Tech- {	<b>5</b> 6	109 112	14 32	8 -	-
6681	Dungannon: Municipal Tech-	-	-	ī	ĩ	-
6066	Galway: City of Galway { Technical Institute.	5 5	44 62	15 15	5 8	- ,
6607	Kilkenny: City Technical {	- 2	52	8	2	-
6163	Kingstown: Municipal Tech-	6 5	113 88	21 17	<b>10</b> 9	-
6043	Kinsale: Technical School, . {			8 5	6 3	
6232	Larne: Municipal Technical School.	2 2	20 25	2	2	-
6039	Limerick : Municipal Science, { Art, and Technical School.	5 16	66 122	25 38	10 15	-
6037	Londonderry: Municipal { Technical School.	5 10	47 71	20 8	10 7	-
6483	Lurgan: Convent of Our Lady of Mercy Technical School.	2	10 13	14	- 5	-
6367	Lurgan: Municipal Technical {	4 2	44 54	6	4	=
6544	Newry: Municipal Technical {	18 10	282 213	12 21	11 11	-
6645	Newtownards: Technical { School.	-	-	ī	-	=
6664	Queenstown: Technical {	=	-	<u>4</u>	1	-
6041	Ringsend: Pembroke Tech-{ nical School.	8 7	109 106	27 13	17 7	-

STATISTICAL TABLES.

### FISHERY STATISTICS-

# STATEMENT of the Total QUANTITY and VALUE of the FISH returned compared with the

			North	Coast.		East Coast.				
	19	1905.		1904.		1905.		04.		
		Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	
, man		Cwts.	£	Cwts.	£	Cwts.	£	Owts.	£	
Brill,						11	18	21	99	
Soles,		8	34	7	24	74	364	154	559	
Turbot,		2	6	•		38	205	14	78	
Total Prime Fish,		10	40	7	24	123	587	189	736	
Cod,				28	10	630	576	748	608	
Conger Eel,				19	14	432	293	735	374	
Haddock,		54	26	138	45	358	471	803	818	
Hake,						498	778	607	610	
Herrings,		1,708	1,087	2,261	891	7,614	2,123	6,747	2,352	
Ling,			•	•		718	670	163	84	
Mackerel,		2	3	64	10	3,086	545	1,442	332	
Plaice,		388	298	757	506	605	635	994	1,097	
Ray or Skate	. ,	92	24	51	15	565	321	897	175	
Sprats,				•						
Whiting,			•	10	5	432	425	<b>61</b> 0	396	
All other except Shell Fish,		16	6	233	68	1,931	1,003	1,756	822	
Total, .		2,270	1,484	3,568	1,588	16,992	8,427	15,691	8,404	
SHELL FISH:-		No.		No.		No.		No.		
Crabs		4,681	14	6,493	15	17,389	86	13,524	54	
Lobsters, .		3,926	93	8,796	274	5,963	265	4,753	197	
Mussels, .		Cwte.		Owts.	•	Owts. 401	33	Cwts. 214	25	
Oysters, .		No.		No.		No. 1,300	2	No. 5,100	11	
Other Shell Fish,		Owts.		Owts.	2	Cwts. 453	205	Owts.	166	
Total, .			107		291		591		4.58	
Total Value of Fish 1	nnded		1,591		1,879	<b></b>	9.018	<u> </u>	8,867	

IRELAND.

as landed on the IRISH COASTS during the month of September, 1905, as corresponding period in 1904.

	otal.		Coast.	West		South Coast.					
M.	190	05.	1 <b>90</b> 5.		1904.		19	1904.		1905.	
Value	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.
£	Cwts.	£	Cwts.	£	Owts.	£	Cwts.	£	Owts.	£	Owts.
13	44	47	32	36	23	23	18			6	8
1,00	288	968	240	273	90	308	99	176	37	262	59
24	57	412	97	160	39	183	52	15	4	18	5
1,4	389	1,427	369	469	152	514	189	191	41	286	67
6	785	<i>5</i> 96	675	6	9	19	44			1	1
8	761	297	445	3	7					4	13
8	977	525	456	<b>3</b> 0	35	28	44	1	1		
1,8	3,672	928	723	185	446	26	82	1,023	2,619	124	143
4,6	12,835	7,070	22,107	973	2,847	3,514	11,802	389	980	346	983
	163	689	741							19	23
25,4	100,498	5,967	18,711	12,181	46,130	2,673	6,727	12,935	52,862	2,746	8,896
1,9	2,079	1,278	1,379	157	170	101	117	187	158	244	269
1	957	357	713	2	9	12	56			•	
	173	. 53	311	•				27	173	53	311
6	1,294	633	1,121	1 <b>2</b> 8	486	95	271	84	188	113	418
1,6	8,726	1,681	3,379	400	871	348	745	269	866	324	687
39,6	128,309	21,501	51,130	14,534	51,162	7,330	20,057	15,106	<i>57</i> ,888	4,260	11,811
	No.		No.		No.		No.		No.		No.
	21,299	106	23,119	8	994	6	697	2	288	3	352
6	19,748	626	18,551	105	3,547	226	7,447	81	2,652	42	1,215
,	Cwts. 484	69	Owte. 1,278	24	Owts. 270	36	Owts. 872		Owts.		Owts.
	No. <b>5,100</b>	2	No. 1,800		No.		No.		No.		No.
3	Owta. 1,407	359	Owts. 1,464	110	Owta. 625	126	Owts. 755	46	Owts. 870	29	Owts. 256
1,1	•	1,165	•	247	•	393		129	•	74	•
40,7		22,666		14,781		7,723		15,235		4,834	

### FISHERY STATISTICS-

# STATEMENT of the Total QUANTITY and VALUE of the FISH returned compared with the

		North Coast				East Coast.				
	19	105.	05. 1904		4. 1906.		1904.			
	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.		
	Cwts.	£	Cwts.	£	Owts.	£	Cwts.	£		
Brill,					12	21	8	11		
Soles,	. 2	11	5	18	92	479	115	438		
Turbot,			1	2	33	193	25	161		
Total Prime Fish, .	. 2	11	6	20	137	693	148	610		
Cod	. 96	68	203	92	665	628	515	445		
Conger Eel,	. 7	7	9	5	532	326	790	360		
Haddock,	. 317	125	438	191	527	666	<b>93</b> 8	1,098		
Hake,					597	961	419	415		
Herrings,	. 41,064	13,491	491	159	5,201	1,760	5,769	2,022		
Ling,		•.			653	628	102	55		
Mackerel,			.7	1	680	149	1,175	244		
Plaice,	156	136	167	147	912	892	1,487	1,263		
Ray or Skate	. 15	4	10	1	461	232	1,100	198		
Sprats		١.								
Whiting,					471	441	679	446		
All other except Shell Fish,	. 278	39	318	89	1,849	928	1,929	1,022		
Total,	41,935	13,881	1,649	705	12,685	8,804	15,001	8,178		
Shell Fsin :	No.		No.		No.		No.			
Crabs	1,849	4	2,824	6	2,428	18	2,348	14		
Lobsters,	. 1,088	28	1,640	40	1,505	76	1,958	83		
Mussels,	Cwts.		Owts.		Owta. 809	47	Owte. 871	115		
Oysters.	No.		No.		No.	1	No. 8,100	6		
Other Shell Fish, .	Cwts.	•	Cwts.		Owts. 202	150	Cwts. 827	154		
Total,		82		46	•	287		871		
Total Value of Fish landed		13,913		751		8,591		8,649		

NOTE.—The above figures are subject to

IRELAND.

as landed on the IRISH COASTS during the month of October, 1905, as corresponding period in 1904.

	South	Coast.			West	Coast.		Total.					
19	1905.		1904.		1905.		1904.		1906.		04.		
Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value		
Owts.	£	Owts	£	Cwts.	£	Owts.	£	Cwts.	£	Cwts.	£		
4	13			3	6	33	23	19	40	41	1		
55	199	58	277	78	228	63	205	227	917	241	9:		
4	18	4	15	37	148	11	46	74	359	41	2		
63	230	62	292	118	382	107	274	320	1.316	823	1,1		
34	24	4	5	56	22	- 1	1	851	742	728	5		
4	1	4	3	52	17	8	3	596	351	811	8		
		2	1	95	52	72	43	939	843	1,450	1,3		
347	254	862	642	153	67	173	70	1,097	1,282	1,454	1,1		
2,335	934	1,428	568	4,085	1.351	9,405	2,880	52,685	17,536	17,093	5,6		
16	14	3	3	40	8			709	650	105	1		
63,236	14,887	37,516	6,893	54.534	15,406	38,358	8,568	118,450	30,442	77,056	15,7		
176	225	278	263	120	97	132	97	1,364	1,350	2,014	1,7		
18	8	10	1	10	3	•		504	247	1,120	2		
1,049	190	467	100	240	32			1,289	222	467	10		
238	70	848	166	2,096	448	366	116	2,804	954	1,393	7:		
197	246	205	89	1,475	481	676	332	4,099	1,694	3,128	1,5		
68,018	17,083	41,189	9,026	63,073	18,361	49,298	12,884	185,706	57,629	107,137	30,2		
No.		No.		No.		No.		No.		No.			
•	•	•				•		4,277	17	5,172			
120	4	642	25	1,868	60	1,193	38	4,581	168	6,428	18		
Owts. 130	8	Cwts.		Owts. 258	18	Owts. 274	27	Owts. 1,197	78	Owts. 1,145	1		
No. 1,000	5	No. 150	1	No. 236	9	No.		No. 1,243	15	No. 3,250			
Owts. 312	48	Owts. 405	58	Cwts. 772	183	Cwts. 940	174	Owts. 1,886	331	Owts. 1,672	3		
•	65		84		220	•	239	•	604		7		
	17.148		9,110		18.581		12.623		58.233		81.0		

correction in the Annual Returns.

### FISHERY STATISTICS-

# STATEMENT of the TOTAL QUANTITY and VALUE of the Fish returned as compared with the

		1				·			
			North	Coast			East	Coast.	
and the second		19	05.	05. 1904,		19	05.	1904.	
		Quan- tity.	Value.	Quan- tity.	Value	Quan- tity.	Value.	Quan- tity.	Value.
		Owts.	£	Cwts.	£	Cwts.	£	Cwts.	£
Brill, ,				•		8	15	17	95
Soles,				3	7	47	167	83	361
Turbot			•	1	1	23	117	23	128
Total Prime Fish.				4	8	78	299	123	584
Cod		376	192	277	123	898	855	839	556
Conger Eel		16	15	19	14	193	133	671	296
Haddock		307	125	857	295	462	619	263	278
Hake,				•		499	798	211	400
Herrings,		46,436	15,863	12,834	3,311	10,990	3,716	7,333	2,569
Ling,			•	•		487	464	227	130
Mackerel,		•		2	1	183	54	6	4
Plaice,		59	55	99	86	763	739	1,070	1,283
Ray or Skate,		18	4	46	10	489	168	704	132
Sprats,			•					•	
Whiting,		1	1			427	352	708	422
All other except Shell Fish,		364	71	270	65	1,450	721	2,811	1,570
Total,		47,577	16,326	14,408	3,913	16,919	8,918	14,966	8,224
SHELL FISH:		No.	ļ	No.		No.		No.	
Crabs,		1.0.	! !	. 140.		90	1	240	1
Lobsters, .				50	3	664	39	1,202	56
Mussels, .		Cwts.		Cwts.		Owts. 438	82	Cwts. 507	36
Oysters,		No.		No.		No. 252	1	No. 4,284	. 5
Other Shell Fish,		Cwts.		Cwts.		Cwts. 233	114	Owte. 175	79
Total, .					8		187		177
Total Value of Fish	landed,		16,326		3,916	<u> </u>	9,105	•	8,401

NOTE--The above figures are subject to correction in the Annual Returns

IRELAND.

landed on the IRISH COASTS during the Month of November, 1905, as corresponding period in 1904.

	South	Coast.			West (	Coast.			То	tal.	
190	06.	19	04.	190	05.	190	14.	19	05.	190	4.
Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value
Cwts.	£	Cwts.	Ľ	Cwts.	£	Owts.	£	Cwts.	£	Cwts.	£
4	12	1	4					12	27	18	99
59	231	65	256	66	191	40	111	172	589	191	735
12	44	10	36	25	122	12	61	60	283	46	2 <b>2</b> 6
75	287	76	296	91	313	52	172	244	899	255	1,060
44	33	27	29	87	34	31	9	1,405	1,114	1,174	717
		13	2	44	13	23	6	253	161	726	318
2	1	9	6	670	308	315	137	1,441	1,053	1,444	- 716
459	349	347	293	138	61	121	48	1,096	1,208	679	741
665	389	798	266	652	178	5,444	1,469	58,743	20,146	26,409	7,615
9	9			68	29	33	14	564	502	260	144
18,762	3,332	3,969	837	31,859	7,704	17,877	5,694	50,804	11,090	21,854	6,536
511	366	381	382	94	67	116	89	1,427	1,227	1,666	1,840
15	6	3	1	20	4	18	5	542	182	771	148
1,803	289	81	26					1,803	289	81	26
223	76	725	293	1,780	592	209	97	2,431	1,021	1,642	812
278	138	143	72	420	185	414	184	2,512	1,115	3,638	1,891
22,846	5,275	6,572	2,503	35,923	9,488	24,653	7,924	123,265	40,007	60,599	22,564
No.		No.		No.		No.		No.		No.	
.						•		90	1	240	1
				429	13	911	27	1,093	52	2,163	86
Cwts. 219	14	Owts.	7	Cwts. 846	53	Cwts. 110	12	Cwts. 1,503	99	Cwts 646	55
No. 8,666	17	No. 831	12	No. 39,911	61	No. 114,098	133	No. 48,729	79	No. 119,213	150
Owta, 360	80	Owts. 345	53	Owts. 880	172	Owts. 780	151	Cwts. 1,473	346	Owts. 1,300	286
	91		72		299		326	-	577		578
	5,366		2,575		9,787		8,250		40,584		23,142

Liscannor (West Coast) Return not received in time to be included in this Table.

STATEMENT of the TOTAL QUANTITY of FISH landed on the ENGLISH and Welsh Coasts during the Month and Ten Months ended 31st October, 1905, compared with the corresponding Periods of the Year 1904.

				Octo	ober.	Ten Mon 31st C	ths ended stober.
				1905.	1904.	1905.	1904.
					QUAN	TITY.	
			- 1	Owts.	Cwts.	Owts.	Owts.
Brill, .	•••			2,530	2,545	28,409	24,069
Soles,		•••		6,356	7,508	64,866	60,381
Turbot,		•••		7,209	6,222	63,874	59,099
Other Prime	Fish,	•••	•••	-	543	2,685	2,687
	Total 1	Prime Fish,		16,095	16,813	154,834	146,236
Bream		•••		4,016		32,068	-
Catfish,	• •••	•••		2,481	1,293	53,828	41,856
Coalfish				12,683		106,420	
Cod,				94,077	73,949	1,179,964	1,057,855
Conger Eels,	•••	•••		6,552	5,814	46,793	40,187
Dabs,		•••		10,498	9,967	91,309	96,525
Dogfish,		•••		1,416		12,564	_
Dory				322	_	3,034	
Gurnards		•••		8,588	7,628	81,738	78,588
Haddock,				198,056	229.306	1,832,574	2,098,677
Hake				29,420	22,741	445,631	369,176
Halibut,		•••		15,103	8,950	128.813	119,756
Lemon Soles				3,910	3,220	42,478	35,688
Ling,	•	•		14.889	11,581	168,988	148,256
Megrims,				8,558	6,090	52,522	50,614
Monks (or A		•••		4.247	2,689	32,900	28,778
Mullet (Red)				43		1,003	
Plaice,	• ••			97,563	111,818	814,418	750,721
Pollack				1,937		12.665	
Skates and I	Rays			32,893	80,890	305,678	288,399
Torsk.	• •			1,216	1,331	8,265	7,988
Whiting,				22,997	25,193	270,870	216,468
Witches, .				4,742	2,096	39,683	28,805
Mackerel, .				8,102	13,845	718,680	515,278
Herrings, .				901,427	1,130,406	1,658,493	1,848,535
Pilchards, .				6,971	21,399	167,419	140,764
0				582	231	25,905	88,096
Fish, all oth	er, exce	pt Shell Fisi		24,880	87,833	253,048	376,083
	Total,	•••	•••	1,529,264	1,774,578	8,742,075	8,518,224
Shell Fish;-	_			No.	No.	No.	No.
~ .				97,870	109,655	4,901,365	4,910,422
Lobsters.	•			15,571	19,552	579,405	178,812
Oysters.				3,909,000	4,700,900	27,409,854	27,109,200
1			***	Owts.	Cwts.	Owts.	Cwts.
Other She	ll Fish,	•••	•••	49,435	58,866	328,659	822,000

NOTE.—The figures for 1905 are subject to correction in the Annual Returns.

Bream, Coalfish, Dogfish, Dory, Red Mullet, and Pollack, were not separately distinguished in 1904.

STATEMENT of the TOTAL VALUE of FISH landed on the ENGLISH and WRLSH COASTS during the Month and Ten Months ended 31st October, 1905, compared with the corresponding Periods of the Year 1904.

					Oct	ober.		ths ended etober.
					1905.	1904.	1905.	1904.
						VAI	.ue.	
Brill.		•••	•••		£ 6,525	£ 6,658	£ 60,993	£ 60,343
Soles.	•••	•••	•••		88,718	41,651	390,457	363,121
Turbot.	•••	•••	•••		25,775	22,965	224,563	210,759
Other Prin			•••			844	4,213	3,828
		•	me Fish	-	71,018	72,118	680,226	688,046
D				}		12,110		000,020
Bream, Catfish,	•••	•••	•••		1,711	- 440	11,275	
Coalfish.	•••	•••	•••	***	855 3.939	442	15,498 32,830	11,533
Cod.	•••	•••	•••		63,880	47 114	701,339	 506 70E
Conger E	···	•••	•••		3,766	47,114	32,261	595,785
Daba.	-	•••	•••	***	6,483	4,149	64,672	29,800
Dogfish.	•••	•••	. •••	***	306	5,926	3,676	66,7 <b>48</b>
Dory,	•••	•••	•••		222		2,246	_
Gurnards,	•••	•••	•••	]	2.257	2,279	24,939	94 447
Haddock.		•••	•••	[	117.923		1,118,710	24,447
Hake.				1	28,505	92,988 19,822	286,478	1,065,869
Halibut.	•••	•••	•••	:::	28,271	· · · · · · · · · · · · · · · · · · ·	230,229	215,419
Lemon Sol		•••	••	- 1	8,585	21,081	90,152	211,544
Ling.		•••	•••		8,280	6,667	97.819	75,519
Megrims,	•••	•••	•••		4.428	6,825	30,371	76,993
Monks (or		<b>.</b>	•••	***	1,322	2,848 788	11,645	29,239
Mullet (B	_	• -	•••	***	108	100	2,144	9,277
Plaice.		••	•••	:::	80.635	90 500	760,154	
Pollack.	•••	•••	•••	:::	985	82,532	6,732	681,009
Skates and			•••		15,056	15,111	161,440	146,896
Torsk.					444	539	3,181	3,183
Whiting,	•••	•••			9,979		122,792	•
Whitehes.	•••	•••	•••		3,676	7,957 1, <b>234</b>	37.486	89,545 23,868
Mackerel.	•••	•••	•••		4.501	9,311	315,744	•
Herrings.				1	373,044	189,990	650,722	267,697 405.040
Pilchards,		•••	••	***	1.363	6,488	41.376	405,040 44,486
Sprats.		•••	***	***	199	94	4,099	44,480 4,221
Fish, all o	 ther. e	 xcept 8	 Shell Fis	h	11,348	14,115	163,012	208,822
- 2020) 0021 0	•	tal.		·  -	852,969	609,918	5,702,748	4,924,186
	_	u(bl,	•••	•	004,808	008,818	0,104,140	Z,082,100
Shell Fish								
Orabs,	•••	•••	•••	•••	2,171	1,704	56,418	58,254
Lobster	•	***	•••		757	926	26,099	25,186
Oysters,		***	•••	•••	11,302	18,703	77,108	78,116
Other 8	hell Fi	ih,	***	•••	12,784	13,511	96,778	102,991
7	otal,	•••	•••	•••	27,014	29,844	256,393	254,547
. 1	otal v	lue of	all Fish	,	880,003	639,762	5,969,141	5,178,788

NOTE.—The figures for 1905 are subject to correction in the Annual Returns.

Bream, Coalish, Dogish, Dory, Red Mullet, and Pollack were not separately distinguished in 1904.

STATEMENT of the Total Quantity and Value of the Fish returned as landed on the Scottish Coasts during the Month and Ten Months ended 31st October, 1905, compared with the corresponding periods of the Year 1904.

		Oc	tober.	Ten Mo 31st	nths ended October.
		1905.	1904.	1905.	1904.
· · · · · · · · · · · · · · · · · · ·	AL 00. 21 MARKET SAME		QU∆	NTITY.	
Sparling,	•••	Owts.	Cwts. 113	Cwts. 406	Owts. 270 5,735 560,424 14,264 73,354 822,594 822,595 122,520 122,520 62,402 82,402 82,402
Turbot,		480	553	5,561	5,785
Cod, Conger Eel,		47,901 576	59,606 536	594,373 16,345	560,414 14,264
Flounders, Plaice, Brill,	•••	7,479	10,203	AL OLO	75,854
Haddock, Halibut,		81,363 1,483 40,203	1,482	756,084 33,427 5,258,255	39,776
Herrings, Lemon Soles,		. 40,203 . 3,350	1,482 19,318 2,696	5,258,255 26,928	5,318,158
Mackerel, Saith (Coal Fish), Skate and Rays,	•••	8,238	5,642	140,492	122,170
Mackerel, Saith (Coal Fish)		. 101	5,642 2,311 5,941 4,268	19,578 115,036	16,402 82,407
Skate and Rays,	••• , ••	5,281	4.268	89,584	84,411
Torsk (Tusk),		4.998 514	3,392 515 13,132	17.847	24,791 12,090
Whiting, Fish not separately dist	***	. 11,867	13,182	155,791	116.418
except Shell Fish.	ung man Ann	20,296	11,532	100,235	89,611
Total,		243,721	257,066	7,398,207	7,407,485
Shell Fish:—		No.	No.	No.	No.
Crabs, Lobsters,			208,847	1,626,019 1,130,067	2,109,683 666,872
Oysters,		26,350	208,847 91,354 35,100	151,255	104,010
Clams,		Cwts. 490	Cwts. 468	.Owts. 5.490	Owts. 4.791
Mussels, Other Shell Fish,		12,890	468 12,243 4,113	5,490 74,262 45,958	4,791 67,692 49,200
Ovaca initial Finit,	•••	9,009	<del></del>		20,200
			VAI £	£	
Sparling,		. £ 265	983	768	£ 830
Turbot,		1,735	2,136 28,327 224	18.287 252,417	19,178 225,543
Conger Ecl		. 251	224	7,040	6,782
Flounders, Plaice, Brill, Haddock,		49,258	9,552 45,920 3,030 4,784 4,479	7,040 79,669 421,355	\$30 19,178 225,543 6,732 89,656 399,030 59,680 1,000,589 42,444 38,873 6,805 14,033 21,500
Halibut,		. 2,977	3'030	1 916 965	59,580
Herrings, Lemon Soles,		. 5,727	4,479	47,905	42,444
Ling,		. 2,445	1,581 848	43,987 5,485	38,873
Saith (Coal Fish)		1 549	1.023	19.760	14,033
Skate and Rave		1,320 1,471	1,054	22,364 1,733 3,431	21,500 1,782 2,723 87,802
Sprats, Torsk (Tusk),		. 159	123	8,431	2,728
Whiting, Fish not separately dist except Shell Fish.	inguished	5,412 10,128	3,201 5,526	56,916 51,391	47,802 47,805
Total,		. 132,387	112,781	. 2,403,508	2,013,384
Shell Fish:					
Orabs,		. 825	1,191 3,869	10,929	13,582 32,048 752
Lobsters, Oysters,		. 107	110	30,665 620	752
Clams,		. 73	896	792 4,455	4 400
Mussels, Other Shell Fish,	•••	1 1 010	1,109	12,562	668 4,492 14,059
Total,	•••	6,377	7,240	80,023	65,601
Total Value of Fis	h landed,	138,714	119,971	2,463,581	2,078,985

NOTE.—The above figures are subject to correction in the Annual Returns.

STATEMENT of the TOTAL QUANTITY and VALUE of the FISH returned as landed on the IRISH COASTS during the Month and Eleven Months ended 30th November, 1905, compared with the corresponding Periods of the Year 1904.

					Nove	mber.	Eleven Mor 30th No	nths ended vember.	
					1905.	1904.	1905.	1904.	
						QUA	STITY.		
<b>7</b>					Owts.	Cwts.	Cwts.	Owts.	
Brill, Soles,		•••	•••	•••	12 172	18 191	<b>321</b> 3,383	476 2,852	
Turbot,	•••	•••	•••		60	46	752	7596	
Tota	l Prin	ae Fisb	ı <b>,</b>		244	255	4,456	3,924	
Cod,	***	•••	•••		1,405	1,174 726	16,845	18,556 7,318 13,824 12,529 210,189 5,376 501,867	
Conger Lei	ι,	•••	•••	•••	253	726	4,754	7,318	
Haddock, Hake,	•••	•••	•••	:::	1,441 1,096	1,444 679 26,409	9,940 6,394	12,529	
Herrings.					58,743	26.409	255,801	210,189	
Ling, Mackerel,	•••	•••	•••	•••	564	260	8,613	5,376	
Mackerel,	•••	•••	•••	•••	50,804 1,427	21.854	42 <b>2,689</b> 17,198	501,867	
Plaice, Ray or Ska	ıto.	•••	•••	***	542	1,666 771	6,661	9,767	
Sprats,	•••	•••	•••		1,803	Q1 1	3,682	1,563	
Sprats, Whiting,	•••	•••	•••		2,431	1,642 3,638	16.863	19,661 9,767 1,568 19,600 36,801	
Fish not a	ep <b>ar</b> a	tely di	stinguis	ned,	2,512	3,688	34,209	36,801	
except si Tota		···	•••		123,265	60,599	808,105	860,975	
Shall West					NT-	<b>&gt;</b> 7-	No.	No.	
Shell Fish: Crabs,	-				No. 90	No. <b>240</b>	174,775	155 432	
Lobster	s.	•••	•••		1,093	2.168	283,421	118.840	
Oysters		•••	•••		48,729	2,163 119,213	240,076	155,432 118,840 127,563	
Mussels			•••		Cwts. 1,503	Owts. 646	Cwts. 8,457	Owts.	
Other S	hell F	ish,	•••	***	1,473	1, <b>30</b> 0	17,233	7,897 15,038	
					VALUE.				
					£	ę.	Ľ	£	
Brill,		•••			27	£ <b>99</b>	495	1,280 12,540 2,730	
Soles.	•••	•••	•••	•••	589	735	13,729	12,540	
Turbot,	•••	••	•••	•••	283	226	3,185	2,730	
Tota	ıl Prin	ne Fish	ı <b>,</b>		899	1,060	17,409	16,550	
Cod,	•••	•••	•••		1,114	717	11,989	12,165 3,947 10,404	
Conger Ec		•••	***	•••	161	318	3,073	3,947	
Haddock, Hake,	••	•••	•••	•••	1,053 1,2 <b>0</b> 8	716 741	7,678 8 779	10 404	
Herrings	•••	•••	•••		20.146	7.615	8,7 <b>7</b> 9 9 <b>0,993</b>	71,057	
Ling,	•••	•••	•••		502	7,615 144 6,536 1,840 148	7,256	9,892 71,057 2,590 116,170 18,532	
Mackerel.	•••	•••	•••	•••	11,090	6,536	100,483	116,170	
Plaice, Ray or Sks	tte.	•••	•••	•••	1,227 182	1,840	16,97 <b>4</b> 3,6 <b>6</b> 6	16,032 2,512	
Sprats.	•••	•••	•••		289	26	610	2,518 307 10,344 16,162	
Sprats, Whiting,	•••	•••	•••		1,021	812	9, <b>59</b> 6	10,844	
Fish not s	opara	tely d	istingui	med,	1,115	1,891	16,651	16,162	
except at Tota		h. 	•••		40,007	22,564	295,147	290,638	
Shell Fish	•								
Crabs.	•••	•••	•••		1	1	1,136	699	
Lobsten	5,	•••	•••	•••	52	86	7,293	6,369 482	
Oysters.		•••	•••	•••	79	150	405	482	
Mussels Other S	hall Fi	ab	•••	•••	99	255 286	699	583 3,247	
Cittor 6	uou £1	all,	•••	•••	346	200	3,973	3,241	
,	Total,	•••	•••		577	578	18,556	11,890	
Total V	alue of	f Fish I	Landed,		40,584	28,142	308,703	301,968	
					a subject to				

NOTE.—The figures for 1905 are subject to correction in the Annual Returns.

SUMMARY of QUARTERLY AVERAGE PRICES for each Province and for the Whole of Ireland of Crops, Cattle, Sheep, and other Agricultural Produce for the Quarter ended 30th September, 1905, and for the Whole of Ireland for the corresponding Quarter of 1904.

		Prov	INCE.		Whole	Whole
PRODUCT.	Leinster.	Munster.	Uister.	Con- naught.	Ireland, 1906.	Ireland.
Orops :	s. d.	s. d.	s. d.	8 d.	s. d.	s. d.
Wheat, per 112 lbs.	6 114	6 7	_	_	6 11	7 84
White Oats,,	6 24	5 10 <del>1</del>	5 9 <del>1</del>	5 4	5 10 <del>1</del>	6 34
Black Oats, . "	5 114	4 102	-	-	50	5 54
Barley,,	7 61	7 21	_	-	7 21	7 61
Potatoes, . ,,	3 5	3 7	2 84	2 84	3 34	3 31
Hay,,	3 72	2 41	2 94	1 101	2 112	2 94
Perennial Rye Grass Seed, per 112 lbs.	_	_	8 9	_	8 9	8 10 <del>1</del>
Italian Rye Grass Seed,		_	12 9	_	12 9	9 91
Flax, . per 14 lbs.	-	-	7 0		7 0	6 42
STORE CATTLE:	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
One year old, per head,	7 0 9	6 15 9	5 13 10	6 10 1	6 7 11	6 18 4
Two years old, "	10 15 1	8 19 8	8 6 6	9 4 9	928	986
Three years old, "	13 2 9	18 14 4	10 11 7	10 17 5	12 7 1	12 8 9
Springers .,	14 14 0	18 6 6	12 13 11	14 5 6	18 7 11	18 11 4
STORE SHEEP:						
Lambs, per head,	1 7 10	170	0 18 7	1 5 11	1 5 6	162
Over 12 & under 24 months old, "	2 4 3	1 19 3	1 1 6	2 4 1	1 19 3	1 16 0
Two years old and upwards, ,,	1 18 1	1 4 1	116	206	1 18 9	1 17 9
and upwarus, ,,				- ' '	2 10 2	- " -
Miscellaneous Produce:	s. d.	8. d.	8. d.	s. d.	s. d.	s. d.
BUTTER, . per 112 lbs.	103 111	100 72	94 64	94 10	100 72	87 8
Eggs, per 120,	9 1	7 10	_	7 . 54	8 1	6 10
Pork, per 112 lbs.	51 34	51 6 <del>1</del>	49 62	46 71	51 · 4	45 11
Bref, "		-	-	-	53 4	55 24
MUTTON, "	-	-	-		61 54	628
WOOL, per lb.	10	0 117		0 11	-1 0	0 84

STATEMENT showing the WEEKLY AVERAGE PRICES of WHEAT, OATS, and BARLEY per 112 lbs., computed from Market Returns of certain quantities of these Cereals supplied to the Department of Agriculture and Technical Instruction for Ireland by Inland Revenue Officers, during the QUARTER ended 30th SEPTEMBER, 1905.

Ret	Returns received in the Week ended			HEAT.	c	DATS.	BARLEY.			
recei				Quantity.	Average Price per 112 lbs.	Quantity.	Average Price per 112 lbs.	Quantity.		
			s. d.	Owts. of 112 lbs.	s. d.	Cwts. of 112 lbs.	s. d.	Cwts. of 112 lbs.		
July	1,		-		6 8	839	-			
,,	8,		- 1		6 10	1,581	-	-		
10	15,		-		6 74	950	-			
**	22,		- 1		6 8	6171	-			
,,	29,	•	7 24	500	6 61	1,8321		_		
Aug.	5,		_		6 6	1,6471	_	_		
"	12,		_	_	8 14	1,5121				
. ,,	19,		_		5 51	5,424	5 54	197		
**	26,		-	-	5 4	7,550}	5 64	77		
Sept.	2,		6 0	414	5 2	10,586	7 52	380		
••	9,		6 113	2934	5 11	16,4662	7 7	1.285		
11	16,		6 114	1,545	5 1	25,985	7 24	2,519		
**	23,		6 81	629	5 3	23,1211	7 01	3,758		
**	30,		6 94	936 <u>}</u>	5 4	33,3022	7 24	43,558		

TABLE showing the AVERAGE PRICES per 112 lbs., LIVE WEIGHT, of FAT CATTLE and FAT SHEEP sold in the DUBLIN MARKET during the QUARTER ended 30th SEPTEMBER, 1905, and also for the corresponding period during the eight preceding years.

Daggarage		YEAR,									
DESCRIPTION,	1905.	1904.	1903.	1902.	1901.	1900.	1899.	1898.	1897.		
Fat Cattle, .	s. id.		s. d. 31 9½	1	s. d. 81 6}	s. d. 32 64	s. d.	s. d. 29 01	s. d. 29 104		
	35 11	1	l	32 1	Į.	34 51	1	31 84	82 10		

STATEMENT showing the NUMBERS of CATTLE and SHEEP in respect of which "LIVE WEIGHT" Returns have been furnished to the Department of Agriculture and Technical Instruction for Ireland, as under, during the Quarter ended 30th September, 1905.

Total	Numbe <b>r of</b> Sheep included in Returns.	278	8%	27.1	161	220	325	379	430	302	423	197	238	435	70,	4,762
Numbers included in Returns of Live Weight of Fat Sheep furnished by	Mr. Gavin Low (Dublin).	278	523	261	194	190	325	379	027	205	807	197	501	88	376	4,805
Numbers inclu Live Weight furni	Dublin Corporation Market Authorities.	1	9	01	ı	30	ţ	1	I	ı	15	I	23	<b>9</b>	83	157
1	Number of Cattle included in Returns.	204	243	727	253	214	181	235	273	269	263	586	200	215	246	3,295
Numbers included in Beturns of	of Store Cattle furnished by Official Reporters of	1	ı	ı	ı	<b>x</b> 0	i	1	ı	1	ı	ı	ı	ı	1	<b>60</b>
Numbers included in Returns of Live Weight of Fat Oattle furnished by	Mr. Gavin Low Mr. John Bobson (Dublin).	62	88	16	ଛ	ଛ	11	น	19	19	27	15	71	11	22	306
ided in Returns o tt Oattle furnishe	Mr. Gavin Low (Dublin).	105	107	109	103	104	92	127	156	169	150	141	111	138	134	1,748
Numbers inclu	Dublin Corporation Market Authorities.	70	<b>8</b> 3	10;	120	72	72	81	105	81	88	107	75	<b>99</b>	86	1,234
A T T TO THE BOOM		•	•	•	•	•	•	•	•	•	•	•	•	•	•	
	ON CO	•	•	•	•	•	•	٠	•	٠	٠	•	•	•	•	•
	Werk ended	i	ගේ	15.	র্য়	20	'n,	12,	19,	26,	ber 2.	တ်	18	প্ল	ଞ୍ଚ	Totals,
	₩	July	;	ŧ	:	1	August	£	:	2	September 2.		=	•	2	

CREAMERY	BUTTER	PRICE	STATISTICS.
	DOTIFIE	TIVICI	DIVIDION

			Copen To Quota	op i	Manel	nester.	Lb. Rolis, In 24-1b. case. Per Cwt.		
Week' ending			Kroner   Shillings   per   per   50   & Cwt.   & ap-   proximately.		Danish and Swedish Choicest.	Irish Creameries Choicest.	Danish. Free on rail, London. Cash with	Irish. Carriage paid, Passen- ger Train. ch Order.	
Santombon 20			Kr.	s. d.	g. g.	8. 8.	s. d.	s. d.	
September,	•	30,	103	115 8	124 to 127	115 to 118	128 4	126 0	
October, .		7,	103	115 8	124 to 127	115 to 119	128 4	126 0	
,, ,	,, 14		103	115 8	124 to 127	116 to 119	128 4	126 0	
,, .		21,	100	112 4	123 to 126	115 to 118	<b>126</b> 0	122 6	
, .		28,	100	112 4	121 to 124	112 to 116	126 0	122 6	
November,		4,	100	112 4	121 to 125	112 to 115	126 0	123 8	
, .		11,	103	115 8	124 to 126	116 to 118	129 6	128 4	
		18,	103	115 8	126 to 128	114 to 120	129 6	130 8	
, .		25,	101	113 5	126 to 129	118 to 120	128 4	130 8	
December,		2,	98	110 1	121 to 125	_	124 10	128 4	
, .		9,	98	110 1	118 to 122	_	124 10	128 9	
		16,	98	110 1	121 to 124		126 0	129 6	
		23,	98	110 1	124 to 127		126 0	129 6	
"		<b>3</b> 0,	102	114 7	124 to 126		130 8	134 2	

From Manchester prices, from 8s. to 10s. must be deducted in order to arrive at the net return to a Danish Creamery; and from 5s. to 7s. to get net return to an Irish Creamery.

Danish pound rolls are free on rail, London, wrapped in parchment and in cardboard boxes.

Irish pound rolls are carriage paid per passenger train, wrapped in parchment and in cardboard boxes.

If rolls are not packed in cardboard boxes, deduct  $\frac{1}{6}d$ . per lb. = 1s. 2d. per cwt.

An extra charge of  $\frac{1}{8}d$ , per lb. is made where cash does not arrive with order.

Carriage on pound rolls per passenger train is  $\frac{1}{2}d$ . per lb., excluding box; allowing for weight of box, carriage works out at 5s. 2d. to 5s. 8d. per cwt. of butter.

### TABLES SHOWING THE EXPORTS

TABLE
RETURN of the Number of Animals Exported from Ireland to Great
Ports of Embarkation

			CATTLE				SHEEP		Swine.			
IRISH PORTS.	Fat.	Stores.	Other Cattle,	Calves	Total.	Sheep	Lambs	Total.	Fat.	Stores	Total.	
Ballina,	118		129		247	532	5,435	5,967	338		338	
Belfast,	1,227	25,176		44	26,447	3,267	14,719	17,986	2,714		2,714	
Coleraine,		38	3		41				1		1	
Cork,	974	7,617	240	9,107	17,938	3,526	24,131	27,657	2,509		2,509	
Drogheda, .	7,870	3,467			11,337	16,338	23,524	39,862	1,358	11	1,360	
Dublin,	44,067	25,756	170	1,167	71,160	78,816	98,310	177,126	16,817		16,817	
Dundalk,	639	3,478			4,117	5,988	10,757	16,745	4,522		4,522	
Dundrum (Co. Down).		11		i.	11	179		179				
Greenore, .	139	7,618			7,752	9,389	.	9,389	273	22	295	
Larne,	108	3,892			4,000	655	1,449	2,104	61		61	
Limerick,	720	184		2	906	2	283	235			.	
Londonderry, .	1,002	9,442	91	557	11,092	7,352	10,116	17,468	739		739	
Newry,	34	1,337			1,371	838	652	1,490	122		122	
Portrush,	•		•	•							.	
Sligo,	347	759		•	1,106	1,197	4,909	6,106	6,962		5,962	
Warrenpoint, .	12	991			1,003	<b>55</b> 3	3,408	3,956	129	•	129	
Waterford, .	4,985	6,402	59	831	11,777	6,449	21,936	28,385	3,106	.	3,106	
Westport, .	566	11	102	•	679	3,325	5,590	8,915	509	.	500	
Wexford, .	781	108	.	•	889	3,173	1,753	4,926	1,166		1,186	
Total,	63,539	96,282	794	11,908	171,823	141,579	226,917	368, <b>49</b> 6	40,326	88	40,369	

### AND IMPORTS OF ANIMALS.

L.

Britain during the Three Months ended 30th September, 1905, showing the in Ireland.

			Ног	rses.		Mules		Total	·
Goat	s.	Stallions.	Mares.	Geldings.	Total.	or Jennets.	Asses.	Animals.	IRISH PORTS.
			2	_	2		_	6,554	Ballina.
1 '	86	2	623	1,427	2,062		13	49,298	Belfast.
		_	<b>J2</b> 0		-,002	·	1	43	Coleraine.
'	1	. 8	319	547	874		146	49,125	Cork.
	12		12	21	38			62,613	Drogheda.
	28	67	1,685	1.464	3,206	1	4	268,342	Dublin.
1,	20		208	193	396		216	26,316	Dundalk.
								190	Dundrum (Co. Down),
	4		687	545	1,232		8	18,675	Greenore.
1	1	6	35	44	86		1	6,252	Larne.
١.								1,141	Limerick.
1.		1	61	67	129		2	29,430	Londonderry.
Ι.			1	8	4			2,967	Newry.
1.									Portrush.
			4	3	7		1	18,182	Sligo.
	76		1	4	5			5,169	Warrenpoint.
	2	4	439	498	939	1	4	44,214	Waterford
			. 2	1	3		1	10,107	Westport,
1.			7	13	20			6,961	Wexford,
-	30		4.004	4 900			392	590,589	Total.
1	SU	78	4,081	4,898	8,987	8	243	perthea	TOTAL.

TABLE
RETURN of the Number of Animals Exported from Ireland to Great
Ports of Debarkation

			CATTLE	•		1	Внеер.		Swine.			
BRITISH PORTS.	Fat.	Stores.	Other Cattle.	Calves.	Total.	She <b>e</b> p.	Lambs.	Total.	Fat.	Stores.	Total.	
Ardrossan, .	329	6,615		16	6,960		485	485	214	•	214	
Ayr,	119	9,164	•		9,283	708	1,487	2,140	409		409	
Barrow,	222	1,185	•	1	1,408	110	162	272	920		920	
Bristol,	791	3,559	•	2,173	6,523	4,593	10,203	14,796	1,301		1,301	
Campbelltown,		35	•		36						•	
Dover				•	•				•		•	
Falmouth, .	•	2		2	4						•	
Fleetwood	42	2,114		28	2,184	3,452	9,978	13,430	705	•	705	
Glasgow,	6,818	17,124	612	1,417	25,471	903	5,510	6,413	6,058	•	6,058	
Greenock,	91	1,417			1,508	30	22	52	5		6	
Heysh <b>am</b> ,.	<b>86</b> 0	7,218	•	101	8,179	3,358	1,150	4,508	2,764		2,764	
Holyhead, .	9,327	15,164	14	213	24,718	37,385	24,949	62,384	9,354	22	9,376	
Liverpool,	33,537	21,201	164	2,363	57,255	80,268	147,051	227,319	16,469	11	16,480	
London,	•	1	•	•	1			•	•		•	
Manchester, .	4,927	107	3	1	5,088	8,300	7,372	13,672	723		723	
Milford, .	2,173	6,914	1	4,189	13,277	4,093	17,789	21,882	1,360		1,360	
Newhaven, .	20	17		27	64			•			•	
Plymouth, .	440	143	•	363	946			•			•	
Silloth,	4,118	657		. •	4,775	159	104	263		•	•	
Southampton, .	181	78		324	583		` 48	48	44		44	
Stranraer,	94	3,556			3,660	46	657	708			•	
Whitehaven, .	•	11	•		11	179		179	•		•	
Total, .	63,539	96,282	794	11,208	171,823	141,579	2 <b>26,9</b> 17	368,496	40,326	33	40,859	

II.

Britain during the Three Months ended 30th Sepember, 1905, showing the in Great Britain.

		Horses.			Mules		Total		
	Gosis.	Stallions.	Mares.	Geldings.	Total.	or Jenuets.	Asses.	Animals.	BRITISH PORTS.
	76	•	79	195	274	•		8,007	Ardrossan.
	83	1	22	65	<b>8</b> 8	•	•	12,003	Ayr.
		•	40	148	188	•	1	2,789	Barrow.
	1		162	922	384	1	15	23,021	Bristol.
		•	•	•	•		•	35	Campbellown.
	•	•	17	29	39		•	39	Dover.
	,	•	3	3	6			10	Falmouth.
	2	1	228	505	784	•	3	17,058	Fleetwood.
		3	189	285	477		2	38,421	Glasgow.
			17	9	26			1,591	Greenock.
	2	1	142	274	417		1	15,871	Heysham.
	16	56	1,939	1,596	3,590		4	<b>100,03</b> 8	Holyhead.
	851		560	627	1,177		336	302,918	Liverpool,
i	1	•	3	5	8		1	. 11	London.
	•		80	61	141	1	1	19,576	Manchester.
		11	490	631	1,132		26	37,677	Milford.
	i	•	20	11	31		•	96	Newhaven.
			19	80	43			988	Plymouth.
			19	35	54		1	5,093	Silloth.
		•	34	. 54	88			718	Southampton.
		6	. 34	44	84		1	4,488	Stranmer.
	•	•	1	6	7	• .	•	197	Whitehaven.
	680	78	4,081	4.828	8,967	2	392	590,589	Total.

TABLE
RETURN of the Number of Animals Imported into Ireland from Great Britain
of Debarkation

			CATTLE	•		,	SHEEP.			SWINE	
IRISH PORTS,	Fat.	Stores.	Other Cattle.	Calves.	Total.	Sheep.	Lambs.	Total.	Fat.	Stores.	Total.
Ballina, .				١	•	8	40	48			•
Belfast,	•	4		·	4	6,475	3	6,478	•	1	1
Coleraine, .					•				• •		•
Cork,	• ,	2		2	4	95		95	•		. •
Drogheda, .	•					174		174	•		•
Dublin,		20			20	9,402	3,310	12,712		1	1
Dundalk, .						420		420	•		•
Dundrum, .					•		. •		٠	•	•
Greenore, .	•	1			1						•
Larne,		2			2	1,109	655	1,764			•
Limerick, .	•										
Londonderry .		10		•	10	279	4,067	4,346			•
Newry,											
Portrush,											
Sligo,							40	40			
Warrenpoint, .						61		51			
Waterford, .		44		2	46	93	1	94			
Westport, .											•
Wexford.						1		1			•
Total.				4	87	18,107	8,116	26,323	<b> </b>	9	9
across 1	'	~	'		, ,					1	

III.

during the Three Months ended 30th September, 1905, showing the Ports in Ireland.

		Ho	rses.		Mules		Total	
Goats.	Stallions.	Mares.	Gold <b>in</b> gs.	Total.	or Jennets.	Авнев.	Animals.	IRISH PORTS.
•			•	•	•	•	-48	Ballina
•	3	94	240	387		1	6,821	Belfast.
				•		•		Coleraine.
•	2	42	78	122			221	Cork.
		3	3	. 6			180	Drogheda,
. 1	71	708	491	1,270		1	14,005	Dublin.
•		15	13	28	•		448	Dundalk.
•		•		• 1		•		Dundrum.
•		34	32	86		1	68	Greenore.
•	5	187	90	232			1,998	Larne.
,•		•	•					Limerick.
•		20	19	39			4,395	Londonderry.
•		•	2	2		•	2	Newry.
		•						Portrush.
		7	4	11			51	Sligo.
•	9	4	•	6		1	58	Warrenpoint.
8	1	63	73	187		1	281	Waterford.
		•		•				Westport.
•	<u> </u>	2	5	7		•	8	Wexford.
4	84	1,129	1,060	2,963		. 5	28,584	Total.

TABLE

RETURN of the Number of Animals Imported into Ireland from Great Britain

Embarkation in

			CATTLE				Sh <b>ee</b> p.		Swin <b>e.</b>				
British Ports.	Fat.	Stores.	Other Oattle.	Calves.	Total.	Sh <b>e</b> ep.	Lambs.	Total.	Fat.	Stores.	Total.		
Ardroman, .			•	•		911	•	911	•				
Ayr,	•	2	•	•	2	5,872	248	6,120	•	•			
Barrow,	•					2	3	5					
Bristol, .		3		2	5	20	•	20					
Cardiff,	•		•				•	•					
Fleetwood, .									:				
Glasgow,		44		•	44	5,637	5,069	10,706					
Greenock, .						1,253	5 <b>4</b> 6 .	1,799					
Heysham, .	•	8	•	•	8	44	•	44					
Holyhead, .		14			14	90	30	120		1	1		
Liverpool, .		5		•	5	227		227		1	1		
London,											.		
Manchester, .													
Milford,		1		2	3	δ		5					
Newhaven, .						1		1			.		
Oban,	•					813		318			.		
Plymouth, .	•	•				1		1			.		
Silloth,		1			1	2.865	1,818	4,678			.		
Southampton, .		3			. 3				•		.		
Stranraer		2			. 2	866	407	1,273			.		
Whitehaven, .										•			
Total,	•	83	•		87	18,107	8,116	26,223	• }	2	3		

IV. during the Three Months ended 30th September, 1905, showing the Ports of Great Britain.

	Нон	ses.		Mules	Aggog	/D=4=1	RRITTEU PORTS.		
Stallions.	Mares.	Goldi <b>ngs.</b>	Total.	or Jennets.	Asses.	Animals.	BRITISH PORTS.		
2	7	17	26	•	1	938	Ardrossan.		
	10	19	29			6,151	Ayr.		
	ı	4	5			10	Barrow.		
2	31	30	63		1	90	Bristol.		
							Cardiff.		
3	58	134	195			195	Fleetwood.		
1	39	76	116		1	10,867	Glasgow.		
1	8	8	17			1,816	Greenock.		
	15	17	32			84	Heysham.		
10	366	284	660		1	797	Holyhead.		
2	60	87	149		1	383	Liverpool.		
· j.	1	7	. 8			8	London.		
1.	9	8	17			17	Manchester.		
.	69	91	160			170	Milford.		
		.			•	1	Newhaven.		
.	•	.				313	Oban.		
.	5	28	88			34	Plymouth.		
58	312	154	524		•	5,203	Silloth.		
	1	1	8			5	Southampton.		
5	187	85	227			1,502	Stranger.		
							Whitehaven		
84	1,129	1,050	2,263		5	28,584	Total.		
	2 3 3 1 1 1 10 2 2 3 5 8 5 5 5	2 7 . 10 . 1 2 31 . 3 68 1 39 1 8 . 15 10 386 2 60 . 1 . 9 . 69	2 7 17 . 10 19 . 1 4 2 31 30	2 7 17 26 . 10 19 29 . 1 4 5 2 31 30 63	Stallions.         Mares.         Goldings.         Total.         Jennets.           2         7         17         26         .           10         19         29         .           1         4         5         .           2         31         30         63         .           3         58         134         195         .           1         39         76         116         .           1         8         17         .         .           10         386         284         660         .         .           2         60         87         149         .         .           3         9         8         17         .         .           4         9         8         17         .         .           5         28         33         .         .           5         28         33         .         .           68         312         154         624         .         .           6         137         85         227         .         .	Stallions.       Mares.       Goldings.       Total.       or Jonnets.       Asses.         2       7       17       26       .       1         .       10       19       29       .       .         .       1       4       5       .       .         .       2       31       30       63       .       1         .       3       58       134       195       .       .         .       1       39       76       116       .       .         .       15       17       32       .       .       .         .       15       17       32       .       .       .         .       10       366       284       660       .       1       1         .       1       7       8       .       .       .         .       9       8       17       .       .       .         .       9       160       .       .       .       .         .       5       28       33       .       .       .         .       1       1       2	Stallions.         Mares.         Goldings.         Total.         Jonets.         Asses.         Animals.           2         7         17         26          1         938            10         19         29          6,151            1         4         5          10           2         31         30         63          1         90		

## RETURN of the Number of Animals Exported from Ireland to the showing the Ports of

			OATTLE						
IRISH PORTS.	Fat.	Sto <b>res</b> .	Other Cattle.	Calves	Total.	Sheep.	Lambs.	Total.	
BELFAST,	65	293		7	365	127	1,299	1,496	
DUBLIN,	16				16	197	1,481	1,678	
TOTAL,	81	293	•	7	381	324	2,780	8,104	

## RETURN of Number of Animals Exported from Ireland to the showing the Ports of Debarkation

,			Cattle	G.					
ISLE OF MAN PORT.	Fat.	St <b>or</b> es.	Other Ca <b>ttle</b> ,	Calves	Total.	Sh <b>e</b> ep.	Lambs	Total.	
DOUGLAS,	81	293	•	7	881	324	2,780	8,104	

# RETURN of the Number of Animals Imported into Ireland from the showing the Ports of

		(	OATTLI	B.					
IRISH PORTS.	Fat.	Stores.	Other Cattle.	Calves	Total.	Sheep.	Lambs,	Total.	
BELFAST,	•								
Dublin,	•				•				
Total,	٠	. •	•	•	•	•	•	•	

## RETURN of the Number of Animals Imported into Ireland from the showing the Ports of Embarkation

		(	Cattli	L					
ISLE OF MAN PORT.	Fat.	Stores.	Other Cattle.	Calves	Total.	Sheep.	Lambs,	Total.	-7
DOUGLAS,	•	•		•	•	•	•	•	

ISLE OF MAN during the Three Months ended 30th SEPTEMBER, 1905, EMBARKATION in IRELAND.

	SWINE.				Hor	ses.					·
Fat.	Stores.	Total.	Goats.	Stal- lions.	Mares.	Geld- ings.	Total.	Mules or Jennets	Авнен.	Total Ani- mais.	IRISH PORTS.
				1	15	34	50			1,841	BELFAST.
•										1,694	DUBLIN.
•	•	•	•	1	15	34	50	·	·	3,535	TOTAL.

ISLE OF MAN during the Three Months ended 30th SEPTEMBER, 1905, in the ISLE OF MAN.

	BWINE.				Hor						
Fat.	Stores.	Total.	Goats.	Stal- lions.	Mares.	Geld- ings.	Total.	Mules or Jennets	A8808.	Total Ani- mals.	ISLE OF MAN PORT.
•	•	•	·	1	15	34	50		•	3£4,8	DOUGLAS.

ISLE OF MAN during the Three Months ended 30th SEPTEMBER, 1905 DEBARKATION in IRELAND.

	SWINE										
Fat.	Stores.	Total.	Gonta.	Stal- lions.	Mares.	Geld- ings.	Total.	Mules or Jennets	Asses	Total Ani- mals.	IRISH PORTS.
											BELFAST.
Ŀ		•									DUBLIN.
•	•	•	•		•	•	•	•	•	•	TOTAL.

ISLE OF MAN during the Three Months ended 30th SEPTEMBER, 1905, in the ISLE OF MAN.

	SWINE.				Hor						
Fat.	Stores.	Total.	Goats.	Stal- lions.	Mares.	Geld- ings.	Total.	Mules er Jennets	Asses	Total Ani- mals.	ISLE OF MAN PORT
	•	•	•		•	•	•	•	•	•	DOUGLAS.

COASTING AND

RETURN of the Number of Animals Shipped to and from Places in Ireland of Embarkation

_			CATTL	E.			She <b>ep</b> .			SWINE	•
IRISH PORTS.	Fat.	Stores.	Other Cattle.	Calves.	Total.	Sheep.	Lambs.	Total.	Fat.	Stores.	Total.
Cork to Aghada Pier,		,		6	6	3	10	13			
" to Belfast											
" to Spike Island, .	١.									19	19
" to Queenstown.				١.		2		2	١.		
, to Waterford,	١.	15		27	42						
Total, .	-	15		33	48	5	10	15		19	19
Aghada Pier to Cork, .	-			<b> </b>	-	72	127	199	54	1	55
Spike Island , .				.					13		13
Queenstown " .				1	1			١.	34		31
Waterford " .	<u>-</u>	<u></u>		<u>                                     </u>	<u>  :</u>	1_	<u></u>	1			
Total,	<u>  · </u>	·		1	1	73	127	200	101	1	102
Waterford to Ballyhack, .		7			7	١.			١.		.
" to Belfast, .									١:	! :	
, to Duncannon,	<u>  :</u>	117	<u> </u>	31	148	<u> </u>	5	5	3	3	6
Total,	·	124		31	155	<u>  :</u>	. 5	6	3	8	6
Ballyhack to Waterford, .									8		8
Belfast to Waterford, .						5	1	6	·		•
Duncannon to Waterford,	105	108		1	214	83	359	442	1,438	•	1,433
Kilrush to Limerick, .	6	96			102	22	44	66	1,983		1,933
Kildysart " .	1 .					.	•		•	•	
Kilkee "						١.			70		70
Portumna	1.				1.	1 4		1	28		28
Scariff Banagher	1:	1:	1:	1:	1:	1.	1:	١. ١	1.	1:	.
Total,	6	-	- - <u>:</u> -	- <del>  -</del>	102	26	44	70	2,081		2,031
Greencastle to Greenore,	╽.	149	<del> </del>		150	316	<del>                                     </del>	816	1 8	-	8
	-	-	-	-	- 2	19	1.	12	+	-	-
Londonderry to Moville, .	<u> -</u>	8	-	<u> </u>					上	-	<u> </u>
Moville to Londonderry, .	<u> </u>	216		<u>  · </u>	216	180	-	180	<u> </u>		8
Ballina to Sligo,					1 .	1 .	1.		1		1
Belmuliet	<u> </u>	1_7	<u>.</u>	<u> </u>	7	58	268	321	556	-	556
Total,	<u>  :</u>	7	·	<u>.</u>	7	58	263	321	567		557
Sligo to Belmullet					•	Ŀ	•		Ŀ		•
Total, .	111	717		67	895	758	809	1,567	4,144	<b>\$3</b>	4,167

## INLAND NAVIGATION.

during the Three Months ended 30th September, 1905, showing the Places and Debarkation.

		Ног	rses.		Mules or		Total	
Goats.	Stallions.	Mares.	Geldings.	Total.	Jennets.	A8608.	Animals.	Irish Ports.
				•			19	Cork to Aghada Pier,
	.			•		•		" to Belfast.
		•		•			19	" to Spi <b>ke Island</b> .
		•					2	" to Queenstown.
٠	.	28	17	45			87	,, to Waterford.
•		28	17	45		•	127	Total.
		•					254	Aghada Pier to Cork.
:		•		•		•	13 <b>3</b> 5	Spike Island " Queenstown "
:		•					1	Waterford ,
		•	•	•	•	•	303	Total.
		•		•			7	Waterford to Ballyhack.
		•		•	•	•		" to Belfast.
<u> </u>	<u> </u>		<u> </u>		<u> </u>		159	" to Duncannon.
<u> </u>		•			<u> </u>		166	Total.
	<u> </u>	•			· .	•	8	Ballyhack to Waterford.
		•	1	1	•	•	7	Belfast to Waterford.
		1	1	2		1	2,092	Duncannon to Waterford.
		3		3		1	2,105	Kilrush to Limerick.
١ .		•		•			•	Kildysart " Kilkee
I :	I : I						70	Portumna "
		•		•			82	Scariff "
<u></u>	<u> </u>		<u> </u>		·		<u>.</u>	Banagher "
	<u>.                                    </u>	8		8	·	1	2,207	Total.
· .	·						474	Greencastle to Greenore.
·				•	•	•	14	Londonderry to Moville.
	•	•					899	Moville to Londonderry.
		1		1			3	Ballina to Sligo.
- <u>:</u> -	<del>  :</del> -		<u> </u>	<u> </u>	<u> </u>		884 886	Belmullet "
一			-		- <u>-</u> -		580	Sligo to Belmullet.
<u> </u>	-	•	•	•		•	<u> </u>	DUEA M. DOUMANAR
·		83	19	52		2	6,683	Total.

RETURN of the Number of Horses Exported from Ireland through Great Britain to the Colonies and Foreign Countries during the Three Months ended 30th September, 1905, showing the Ports of Embarkation in Ireland.

						Number	of Horses.	1	
	Por	rs.			Stallions.	Mares.	Geldings.	Total.	
Belfast,	•	•	•		_	77	90	167	
Cork, .			•		-	11	6	17	
Dublin,					1	187	283	491	
Greenore,	•			٠,	-	213	84	297	
Larne,				.	2	· <del></del>	-	2	
Waterford,		•	•	$\cdot$	-	67	47	114	
Tota	ıl,				3	<b>56</b> 5	460	1,018	

RETURN of the Number of Horses Imported into Ireland through Great Britain from the Colonies and Foreign Countries during the Three Months ended 30th September, 1905, showing the Ports of Debarkation in Ireland.

	fu.			Number of Horses.							
	Por	TS.		Stallions.	Mares.	Geldings.	Total.				
Bolfast,	•	•			- 82	51	- 68				
Dublin,	•	•	•	<b>68</b>	320	160	588				
T	otal,	•	•	<b>68</b>	852	211	691				

### DISEASES OF ANIMALS IN IRELAND.

NUMBER of OUTBREAKS of SWINE-FEVEE, and Number of SWINE returned as having been SLAUGHTERED in Ireland, under the Diseases of Animals Act of 1894, in the undermentioned period, by Order of the Department.

						SWI	TE-FEVER.
	Quart	er en	deđ			Outbreaks confirmed.	Swine Slaughtered as Diseased or as having been Exposed to Infection
September, 1905,	•	•		•	•	30	946

NUMBER of OUTBREAKS reported as having taken place, and NUMBER of ANIMALS returned as having been attacked by ANTHRAX and GLANDERS in Ireland in the undermentioned period.

	ANTH	RAX.	GLAN (including		Epizootie Lymphangitis.		
Quarter ended	Outhreaks Reported.	Animals Attacked.	Outbreaks Reported.	Animals Attacked.	Outbreaks Reported.	Animals Attacked.	
September, 1905,	1	1	5	22	2	9	

## NUMBER of Cases of RABIES in DOGS in IRELAND during the undermentioned period.

	Q	aarter	ended			Number of Cases.
September, 1905,	•	•	•	•	•	Nil.

NUMBER of OUTBREAKS reported as having taken place, and NUMBER of ANIMALS returned as having been attacked by SHEEP-SCAB and PARASITIC-MANGE in Ireland in the undermentioned period.

	SHEEL	P-SCAB.	PARASITI	C-MANGE.
Quarter ended	Outbreaks Reported.	Sheep Attacked.	Outbreaks Reported.	Animals Attacked.
September, 1905,	17	104	29	50

Veterinary Branch,
Department of Agriculture and Technical Instruction for Ireland,

ACCOUNT showing the QUANTITIES of certain kinds of AGRICULTURAL into Ireland in each WEEK from

				WEEK ENDED					
	ARTICLI	RS.		2nd Sept.	9th Sept.	16th Sept.	23rd Sept.	30th Sept.	
ANIMALS, LIV	VING-						_		
FRESH MEAT	· .	-		•	•		•	•	
Beef, ,			. owts.						
Mutton, .	•	•	. "	•	•	• ]	•	•	
SALTED OR PI Bacon.	RESERVE	D MEA	. owts.	_					
Beef.	:	:							
Hams, . Pork, .	•	•	. "	850	•	197	•	360	
Meat, une	oumerat	ed, Se	lted or	300	•	17/	•	200	
Fresh, Meat presen	rved oth	erwise	than by	•	•	.	•	•	
salting,		•	. cwts.	•		648		23	
DAIRY PRODU	CE AND	SUBST	TUTES-				1	1	
Butter, .	•	•	. cwts.	153	ا ہے.	.,,,	٠,,	2	
Margarine, Cheese,		:	: "	102	167	139	82	216	
Milk, Conde	ensed,	•	. ,,	44	42	30	15	24	
, Orean	n, rved, oth	er kind	8 "	: 1	: 1	:	: 1	•	
ggs.	•		hunda.	2.467	2.487	72		4.494	
ARD.			cwts.			289			
JORN, GRAIN,	MEAT. A	ND Fi		•	.	200	. 1	•	
Wheat			. cwts.	119,400	10,000	314,300	145,700	198,200	
Wheat, Mea	al and Flo	our	. ,,	5,900	•	97,800 19,100	6,100 27,700	33,500 8,100	
Oats, .	:	:	: ;;					•	
Peas, . Beans, .	•	•		40	1,590	80	80	90	
Maize or In	dian Cor	'n,	: ",	237,300	833,400	161,100	288,700	234,900	
RUIT, RAW-									
Apples, Currants,	•	•	. cwts.	•	129	• }	41	65	
Gooseberrie	8, .	:	: ",	:			: 1	:	
Pears	•	•	. ,	162 215	96	.	70	181	
Plums, . Grapes, .	•	:	: ;	210	137	:	16	:	
Lemons, .	•	•	• "	.		:	ĭ		
Oranges, . Strawberrie	98	•	: ".	: 1	•	: 1	: 1	•	
Unenumera	ted,	•	: "	: 1		:	:		
HAY,			. tons	.		85	40	80	
TRAW, .			. "		307	180	6	127	
foss Litter,			. "	33	38	62	- 62	.	
IOPS,	•		. owts.	. 1	.		. 1	• 1	
EGETABLES,	RAW								
Onions, .	•	•	bushels . owts.	644	1,168	1,660	4,622	2,810	
Potatoes, Tomatoes,	:	:	!	:		,	: 1	:	
Unenumera	ted,	•	. ″£	2	18			.	
Preserved b	DRIED— y Cannin	ıg,	. cwts.	g		194	.	.	
OULTRY AND	GAME.		. £	. 1	.			. 1	
		•		- 1	-	- 1	- }	- 1	

<sup>\*</sup>This Table is confined to the Imports of certain kinds of Agricultural Produce into to a request from this Department kindly consented to separate the Irish Imports (direct) form of Weekly Returns. It is hoped that the Department may soon be able to secure with these and such returns as the above, the Department will be in a position manufactured and agricultural products.

PRODUCE Imported direct (i.e. from the Colonies or Foreign Countries) 2nd September, 1905, to 25th November, 1905\*.

•			WEEK	ENDED			
7th October.	14th October.	21st October.	28th October.	4th Nov.	11th Nov.	18th Nov.	25th Nov.
•	•	•	•	•			•
			2,340		_	_	
•	•	•	300	•	•		:
							•
•	•	•	• 1	•	•	•	•
:	394	:			197	64	1
•	•	•	•		•	•	•
•	241	89		88	1,366	•	:
• 100	• 05	• 140	. 040			•	• .
162	. 87	148	248	173	181	118	. 1
91	63	43	83	36	94	17	- 1
:			8		:	:	:
1,865	<b>3</b> 60	1,489	960	360	143	1,128	5,1
989	374	20	4	100	169	7	7
100,500 61,300	88,600 39,100	61,700 60,800 68,200	238,900 41,800 30,100	35,400 74,000 27,400	52,600	135,700 95,900 47,000	51,1 6,1
•	. 20	100	100	•	. 20	290	• *
77,100	318,900	140,500	179,700	168,000	81,900	6,600	207,0
22		17	44	_		27	·
. **				:	:	. "	:
· <b>1</b> 5	•	* 38	: 1	: 1	• 1	•	•
	:				:		•
:	:	:		16 50			•
				•	.	.	:
:	1 :	:		:	: 1		:
8		7	31		.	71	1
	202			38	.	264	
37	30	104	39	125	105	24	,
•	• •	•		•	•	•	•
4,114	5,332	3,338	2,080	5,948	2,270	6,096	4,8
:	: 8	:		. 8	: 4		:
• .		•	•		•	•	•
	10	•	•	7	•	•	•
•					•	.	

Ireland from the Colonies and Foreign Countries. The Board of Customs have in answer from those of the United Kingdom, and to supply this Department with them in the returns of Imports of all classes into Ireland which are re-shipped from Great Britain, to gauge the economic dependence of this country on other countries for its supplies of

Statistics and Intelligence Branch,

Department of Agriculture

and Technical Instruction for Ireland.

### EMIGRATION.

RETURN of the Numbers, Nationalities, and \*Destinations of the Passengers that left the United Kingdom for places out of Europe during the Month ended 30th November, 1905, and the Eleven Months ended 30th November, 1905, compared with the corresponding periods of the previous Year.

		:	Br <b>it</b> ish	Empiri	В.		FORE	gn Cou	TRIES.		Total
NATIONALITY.	British North America	Austra- lia and New Zealand.	British South Africs.	India, includ- ing Ceylon.	Other British Colonies and Pos- sessions.	Total.	United States.	Other Foreign Coun- tries,	Total.	Grand Total.	for corres- ponding Period of 1901.
		Month ended 30th November,									
English,	2,231	1,856	2,097	903	451	7,538	3,795	700	4,495	12,033	18,108
Scotch,	290	805	360	44	17	1,016	994	63	1,057	2,073	1,968
Irish,	112	146	107	6	3	373	1,776	26	1,802	2,175	2,734
Total of British origin.	2.633	2,307	2,564	952	471	8,927	6,565	789	7,354	16,981	16,906
Foreigners,	1,565	42	356	20	45	2,028	8,650	202	8,752	10,780	16,829
Nationalities not distinguished.	4	-	-	470	203	677	62	819	381	1,058	1,050
Total, .	4,202	2,349	2,920	1,442	719	11,632	15,177	1,310	16,487	28,119	84,187
Total for corresponding period, 1904.	8,640	1,648	2,614	1,259	748	9,904	23,345	938	24,283	84,187	
		A CAMPAN	in bour to a blace	Eleve	n Mon <b>th</b> s	ended 30	th Nover	aber.	<del></del>		
English,	63,940	11,589	19,217	4,104	3,770	102,620	55,364	5,306	60,670	163,290	168,05
Scotch,	14,049	1.707	4,252	273	193	20,474	19,092	612	19,704	40,178	36,066
Irish,	3,292	767	1,141	31	42	5,278	43,722	251	43,973	49,246	57,18
Total of British origin.	81,281	14,063	24,610	4,408	4,005	128,367	118,178	6,169	124,347	252,714	261,28
Foreigners,	24,600	816	4,318	150	304	29,688	145,468	3,984	149,402	179,090	161,00
Nationalities not distinguished.	40	5	_	2,874	2,161	4,580	1,402	2,590	3,992	8,572	7,480
Total, .	105,921	14,384	28,928	6,932	6,470	162,635	265,048	12,693	277,741	440,876	429,79
Total for corresponding period, 1904.	89,810	18,165	<b>\$</b> 0,198	6,472	6,230	145,875	275,569	8,855	284,494	429, 799	

<sup>\*</sup>The destinations given are, in all cases, based on the ports at which the passengers contracted to land.
NOTE.—The above figures, being made up at the earliest possible date after the close of each Month, are subject to correction in the Annual Returns.

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A. T. & Co. (Lad.)

Vol. VI. No. 3.

### DEPARTMENT OF AGRICULTURE

AND

TECHNICAL INSTRUCTION FOR IRELAND.

# JOURNAL.

Field Experiments in 1905—American Gooseberry Mildew—Redwater in Cattle—Felling and Selling of Timber—Planting and Management of Hedges—A Disease of Young Cattle in Co. Wexford—Method in Educational Institutions—Official Documents—Notes and Memoranda—Statistical Tables.

SIXTH YEAR.

No. 3.

APRIL, 1906.



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PRICE SIXPENCE.

## CONTENTS.

771 1 1 1 1 1		<b>.</b>							Page
Field Experiments	, 1905,		•	•	•	•	•	•	403
1)	,,	Meadow	Hay,	•		•	•		416
,,	"	Potatoes,							419
,,	;;	Mangels,	, .				,		426
,,	,,	Oats,	•			•			432
,,	,,	Turnips,	•				•		436
American Goosebe	rry Mi	ldew, .	•		•				445
"Redwater" or "	Blood 1	Murrain "	in Car	ttle,					448
Forestry: Felling	and Se	lling Timl	ber,	•					451
The Planting and		15	•						455
A Disease of Your	-		_						460
Method in Educati				•			•		477
OFFICIAL DOCUME	NTS:-	-							
Agriculture,	•								496
Technical Inst	truction	), .							<b>5</b> 25
Veterinary,									531
Notes and Memo					•				
Meetings of the	Board	ls. (554).	Meeti	ng of	the	Join	t Con	ımitt	ee of
Co. Dublin Urba		. ,							•
of Secondary So			•		•			•	
(557). Canal Co		• •		•					
(558). Irish M		. ,			-				
of Embargo on I	•	-		•		•		vv v 1 1 (C	
STATISTICAL TABLE			CONTROLOGIC		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	(001)	•		564

#### NOTICE.

Communications respecting the literary contents of this JOURNAL should be addressed to the Superintendent of the Statistics and Intelligence Branch, Department of Agriculture and Technical Instruction for Ireland, Upper Merrion-street, Dublin.

Communications respecting Advertisements should be addressed to Alex. Thom & Co. (Limited), Middle Abbey-street, Dublin: or to Laughton & Co. (Limited), 1 Essex-street, Strand, London, W.C., and not to the Department of Agriculture and Technical Instruction for Ireland.

### FIELD EXPERIMENTS, 1905.

#### I.—BARLEY.

These experiments are a repetition of those carried out in 1901, 1902, 1903, and 1904. The object is to ascertain:—

- (1) The most suitable variety to grow in the barley districts in Ireland;
- (2) The most economical artificial manures for barley.

The results are considered from two standpoints:-

- (a) Yield and market value of the crops;
- (b) Their merits for malting and brewing purposes.

The 1905 experiments were extended to King's County, and consisted of:—

Series No. 1.—Large Scale Experiments.—These were carried out at two centres in each of the following counties:—Cork, Tipperary, Wexford, Louth, and Queen's County, and at one centre in King's County. The plot at each centre was divided into five subplots of two statute acres.

The varieties tested were Archer, Goldthorpe, Hallett's, and Old Irish in all counties, with the addition in Cork of Standwell and Scotch Chevallier, in Tipperary of Scotch Chevallier and Beardless, in Louth of Standwell and Scotch Chevallier, in Wexford and King's County of Scotch Chevallier, and in Queen's County of Beardless and Scotch Chevallier.

Plots of ten acres were sown in Counties Cork, Wexford, Louth, and Queen's County with Archer, Hallett's Pedigree, Goldthorpe, Old Irish, and Scotch Chevallier respectively, to provide seed for experiments in 1906.

Series No. 2.—Small Scale Experiments.—These were reduced in 1904 to two manurial experiments in County Cork; the increase in the number of the Large Scale Experiments being deemed sufficient for the comparison of the varieties of barley at present being tested. In 1905 they again consisted of two series. Each plot was two acres in extent, and was divided into eight subplots of one quarter acre each, for the purpose of testing the effects of the application of sulphate of ammonia, superphosphate and kainit alone, and in combination.

All the samples were valued as delivered in Dublin.

The season of 1905 was more favourable for the barley crop than the two preceding years. The autumn of 1904 and the spring of 1905 were fine, and enabled the land to be more thoroughly tilled than it was in the corresponding period of 1903-1904. January and February were fine months, but only in a few cases was advantage taken of the favourable weather in the latter month to sow the corn. March proved an extremely wet month, and consequently very little sowing was done until the early part of April. The seed-bed was not then very fine, and this accounts for the great unevenness noticeable in the growing barley throughout the whole country during the year. The summer was remarkably fine and exceptionally favourable for barley. Most of the cutting was done in the fine weather of early August, but a great deal of damage was caused to the corn while in stook by the torrential downpour which occurred from about the middle to the end of this month. The high temperature during this heavy downpour caused the fully ripened corn to germinate to a serious extent in many cases. September was a finer month, and most of the corn was at length harvested in a satisfactory condition.

#### VARIETY TEST.

Series No. 1. Large Scale Experiments.—The object of this experiment was to compare the yield and quality of the following varieties:—Archer, Goldthorpe, Hallett's, Standwell, Old Irish, Scotch Chevallier, and Beardless. These were grown at eleven centres as detailed below:—

The following Table shows in each centre the name of the experimenter, the character of the soil and subsoil, and its previous treatment:—

Name of Centre.	Experimenter.	Character of Soil and Subsoil.	Previous Treatment of Land.
1. Midleton, Co. Cork.	P. M'Carthy, Ballina- curra,	Good limestone loam. Subsoil—Yellow fri- able clay. Geol. form.—Carboni- ferous limestone.	1903, Outs. 1904, Roots, with farm- yard manure.
2. Whitegate, Co. Cork.	R. Hawkins, White- gate.	Good brownstone loam. Subsoil—Brownstone gravel and shale. Geol. form.—Old Red Sandstone.	1903, Oats. 1904, Roots, with farm- yard manure and artificials.
3. Nenagh, Co. Tipperary.	J. Wolfe, Rockford,	Good loam of me- dium depth. Subsoil — Gravelly clay. Geol.form.—Carboni- ferous limestone.	1903, Barley. 1903, Roots with farm- yard manure and artificials.
4. Birr, Co. Tip- perary.	J. Willington, St. Kieran's.	Strong deep loam. Subsoil — Gravelly clay. Geol. form.—Carboniferous shale.	1903, Barley. 1904, Potatoes.
5. Wexford, Co. Wexford.	W. B. Nunn, Castle Bridge.	Good fertile loam, Subsoil—Sand, Geol. form.— Cam- brian,	1903, Grass. 1904, Oats.
6. New Ross, Co. Wexford.	J. Dooley, Rosbercon.	Good medium loam. Subsoil—Shale. Geol. form.—Lower silurian.	1903, Oats. 1904, Roots, with farm- yard manure and artificials.
7. Carlingford, Co. Louth.	J. Kearney, Wilville,	Gravelly drift loam. Subsoil—Gravelly, Geol. form.—Carboni- ferous limestone.	1903, Barley. 1904, Roots, with farm- yard manure and artificials.
8. Dunleer, Co.Louth,	S. Segrave, Dunany,	Strong deep loam. Subsoil—Yellow clay and shale. Geol. form. — Lower silurian.	1903, Barley, 1904, Roots, with farm- yard manure.
9. Portarlington, Queen's Co.	W. Kelly, Cahrn House.	Good light loam. Subsotl — Limestone gravel. Geol. form.—Carboni- ferous limestone.	1903, Oata 1904, Roots, with farm- yard manure and artificials.
10. Monasterevan, Queen's Co.	R. Luttrell, New Inn.	Sandy loam of good depth. Subsoil — Sand and Limestone gravel. Geol. form.—Carboni- ferous limestone.	1903, Lea oats. 1904. Roots, with farm- yard manure and artificials.
11. Tullamore, King's Co.	J. Matthews, Ashfield.	Medium leam of good depth. Subsoil—Yellow clay and gravel. Geol. form.—Carboni- ferous limestone.	1903, Oats. 1904, Potatoes, and turnips,

NOTE.—At Centre No. 6 the land received in February a complete dressing of artificial manure, consisting of—1 cwt. sulphate of ammonia, 3 cwt. superphosphate, and 3 cwt. kainit.

## LARGE SCALE

	i	ARCHI		GOLDTHORPE.			
1							
FARM.	Yield		Value.	Yield per	Value.		
	per Acre.	l'er Barrel	Per Acre.	Acre.	Per Barrel,	Per Acre.	
The second secon	Bris. st.	8. d.	£ s. d	Brls. st.	s. d.	£ s. d.	
1. P. M'Carthy, Ballinacurra, Co. Cork.	12 8	14 9	9 4 5	13 1	14 9	9 12 8	
Screenings,	0 8	8 0	0 4 0	0 64	8 0	0 8 8	
Total,	13 0		9 8 5	13 74		9 15 11	
2. R. Hawkins, Whitegate, Co. Cork.	11 11	15 3	8 18 3	11 44	15 3	8 12 0	
Screenings,	0 4	8 0	0 2 0	0 4	8 0	0 2 0	
Total,	11 15		9 0 3	11 84		8 14 0	
3. J. Wolfe, Rockford, Ne-	14 6	14 6	10 8 5	15 10	12 9	9 19 3	
Screenings,	0 101	8 0	0 5 3	0 7	8 0	0 3 6	
Total,	15 0		10 13 8	16 1		10 2 9	
4. J. Willington, St. Kieran's, Birr.	14 104	15 3	11 3 5	13 8	15 <b>3</b>	10 5 11	
Screenings,	1 6	8 0	0 11 0	0 11	8 0	056	
Total,	16 0l		11 14 5	14 3		10 11 5	
5. W. B. Nunn, Castle Bridge, Wexford.	11 6	12 6	7 2 2	11 6	13 3	7 10 9	
Screenings,	1 9	8 0	0 12 6	1 3	8 0	096	
Total,	12 15		7 14 8	12 9		8 0 3	
6. G. Dooley, Hoodsgrove,	13 0	15 0	9 15 0	13 10	15 6	10 11 2	
New Ross. Screenings,	0 91	8 0	0 4 9	0 2	8 0	010	
Total,	13 94		9 19 9	13 12		10 12 2	
7. J. Kearney, Wilville, Car-	14 54	13 3	9 10 1	11 4	13 3	7 9 1	
lingford. Screenings	0 44	80	0 2 3	0 63	8 0	0 3 3	
Total,	14 10		9 12 4	11 101		7 12 4	
8. S. Segrave. Dunany, Co.	14 64	15 9	11 6 11	12 71	15 9	9 16 5	
Louth. Screenings,	0 74	8 0	0 3 9	0 6	8 0	030	
Total,	14 14		11 10 8	12 134		9 19 5	
9. W. Kelly, Cahrn House,	12 1	14 6	8 14 11	10 74	14 9	7 14 4	
Portarlington. Screenings,	0 9	8 0	0 4 6	0 61	8 0	030	
Total,	12 10		8 19 5	10 13#		7 17 4	
10. R. Luttrell. New Inn.	14 8	15 0	10 17 6	12 13	15 0	9 12 2	
Monasterevan, Screenings.	0 5	8 0	0 2 6	0 4	8 0	020	
Total,	14 13		11 0 0	13 · 1		9 14 2	
	13 12	15 3	10 9 8	10 10	14 9	7 16 9	
11, J. Matthews, Ashfield, Tullamore. Screenings,	1 2	8 0	090	0 9	8 0	0 4 6	
Total,	14 14		10 18 8	11 3		8 1 3	
Average,	14 04		10 1 1	12 134		9 8 8	
Average, 1904,	11 6		8 4 6	10 13		8 1 4	
Average, 1908,	10 7		7 5 9	8 10		8 9 5	
Average, 1902,	12 121		9 7 11	12 1		909	
Average, 1901,	11 14	-	8 12 8	9 10	- 1	7 1 11	

### EXPERIMENTS, 1905.

Score	сн Снв	VALLIER.	(	OLD IRI	<b>S</b> H.	HALL	ett's Pe	DIGR <b>EE</b> .
Yield	1	Value.	Yield	1	Value.	Yield	7	alue.
per Acre.	Per	Per Acre.	per Acre.	Per	Per Acre.	per Acre.	Per	Per Acre.
	Barrel			Barrel.	201 11010		Barrel.	101 120101
Brls. st.	s. d.	£ *. d.	Brls. st. 11 91	s. d. 14 3	£ s. d. 8 5 2	Brls. st. 7 114	s. d. 14 0	£ s. d 5 8 1
_	_	_	0 34	8 0	0 1 9	1 64	8 0	0 11 3
			11 13		8 6 11	9 2		5 19 4
10 8	15 3	8 0 2	10 13	14 9	7 19 6	8 10	15 3	6 11 6
0 3	8 0	0 1 6	0 4	8 0	0 2 0	0 7	8 0	0 3 6
10 11		8 1 8	11 1		8 1 6	9 1		6 15 0
14 10	14 9	10 15 9	11 14	15 0	8 18 2	13 154	15 0	10 9 6
0 8	8 0	040	0 83	8 0	0 4 3	0 104	8 0	0 5 3
15 2		10 19 9	12 64		9 2 5	14 10		10 14 9
			13 8	14 9	9 19 2	13 64	15 6	10 7 9
-		-	0 93	8 0	0 4 9	0 5	8 0	0 2 6
			14 14	_	10 3 11	13 111		10 10 3
11 64	12 0	6 16 10	13 6	13 9	9 3 11	8 OF	12 0	5 8 4
1 24	8 0	093	1 7	8 0	0 11 6	1 6	8 0	0 11 3
12 9		7 6 1	14 13		9 15 6	10 7		5 19 7
12 51	14 9	9 2 0	10 2	14 9	7 9 4	10 123	15 6	8 7 2
0 14	8 0	0 0 9	0 5	8 0	0 2 6	0 74	8 0	0 3 10
12 7		9 2 9	10 7		7 11 10	11 4		8 11 0
	-		11 4	13 9	7 14 8	12 8	13 6	8 8 9
			0 7	8 0	0 3 6	0 6	8 0	030
			11 11		7 18 2	12 14		8 11 9
14 8	15 G	11 5 3	11 131	15 0	8 17 7	14 2	16 0	11 6 0
0 5	8 0	0 2 6	0 8	8 0	0 4 0	0 6	8 0	0 3 0
14 134		11 7 9	12 54		9. 1 7	14 8		11 9 0
10 14	14 9	8 0 10	9 14	14 9	7 5 8	10 71	15 3	7 19 7
0 54	8 0	0 9 11	0 83	8 0	0 4 5	0 81	8 0	0 4 2
11 42		8 3 9	10 63		7 10 1	10 154		8 3 9
-	_	· –	12 14	14 9	9 9 11	11 10	15 6	902
			0 64	8 0	0 3 3	0 61	8 0	0 3 3
			13 44		9 13 2	12 04		9 3 5
12 13	14 9	8 18 4	11 9	13 9	7 19 0	11 8	14 3	8 3 11
0 7	8 0	0 3 6	0 14	8 0	0 7 0	0 14	8 0	0 7 0
12 84		9 1 10	19 7		860	12 6		8 10 11
12 124		984	12 4		8 13 8	11 141		8 11 8
10 7	_	7 18 7	11 182		8 8 t		_	
			_			_		
				_			_	
	-	•	_	-	_	_	-	-
1. 1								

COMPARISON OF ALL THE VARIETIES TESTED.

Table showing Average Yields of Good Corn of the Varieties Tested in Counties Cork, Tipperary, Wexford, Louth, Queen's County and King's County, 1905.

County.		ARCHE	R	GOL:		H.	AL- T'S.		LD SH.	CHE	TCH, VAL- ER.	STAND- WELL.	BEARD- LESS.
		Bris. St		Brls.	St.	Brls	. St.	Brls	s. St.	Brls	St.	Brls. St.	Brls. St.
Cork,	•••	12 1	1	12	28	8	22	11	31	10	8	12 12	-
Tipperary,	•••	14 8	ŀ	14	9	13	11	12	11	14	10		13 11
Wexford,		12 3		12	8	9	14	11	12	11	14	-	-
Louth,		14 6		11	134	13	5	11	82	14	81	10 0å	
Quoen's Co., .		13 4		11	10}	11	야	11	6	10	143	_	12 12#
King's Co.,		13 12		10	10	11	8	11	9	12	11	_	
	_												<u> </u>

The Screenings have been valued throughout at 8s. per barrel.

### COMPARISON OF FOUR VARIETIES TESTED AT ALL THE CENTRES.

Archer, Goldthorpe, Hallett's, and Old Irish were grown at all centres, and the average yield and money values per acre for these varieties are shown in the following table:—

Variety.	Average Yield of good Corn per Statute Acre.	Average Value of good Corn per Statute Acre.	Percentage of Screenings.	Average Total Value with Screenings.		
	Brls. Sts.	£ s. d.		£ s, d,		
Archer,	13 5	9 15 6	4.94	10 1 1		
Goldthorpe,	12 6	900	3.63	. 9 3 9		
Old Irish,	11 11	8 9 3	5.98	8 13 8		
Hallett's,	11 4	8 6 5	4.24	8 11 8		

Archer in point of yield has well maintained its position, exceeding Goldthorpe the next heaviest yielding variety, by fifteen stones per statute acre. The quality of the Archer has also shown an improvement on that of previous years, but its lateness in ripening is still very noticeable. During the past season, however, it has been repeatedly noticed that where the barley was sown early the difference in the times of ripening between Archer and other varieties has been greatly lessened.

Goldthorpe still proves a good second to Archer in both yield and money value, but the difference between these two varieties is greater than in 1904, due partially to the loss caused by heads of Goldthorpe breaking off during harvesting, and to the damage sustained during the extremely wet weather in August from which the Goldthorpe appeared to suffer more than the Archer.

Hallett's produced grain of high quality at some centres, but generally showed a decided tendency to weakness in the straw—a defect which in a wet season must have resulted in an entire failure of this variety. At Centres 1, 2, 5, and 6 it became badly laid, and had not the weather during the cutting period remained fine, very little of the corn could have been saved.

Old Irish has not maintained its place either in the yield per acre or in the total value per acre. Its early ripening properties have not been so well marked as in 1904. At Centre 5, however, where the other varieties became badly laid, it was the only one which stood well and yielded a grain up to malting standard.

### Comparison of Archer, Goldthorpe and Scotch Chevallier.

Scotch Chevallier was not grown at all centres. The following table shows the comparative yields and values of Archer, Goldthorpe, and Scotch Chevallier grown at the same centres.

Variety.	Average Yield of good Corn per Statute Acre.	Average Value of good Corn per Statute Acre.	Percentage of Screenings.	Average Total Value with Screenings.
	Brls. Sts.	£ s. d.		£ s. d.
Archer,	12 15	9 10 8	5.42	9 16 8
Scotch Chevallier,	12 5	8 19 10	3.43	9 3 9
Goldthorpe,	12 31	8 17 4	3.82	9 1 0

Scotch Chevallier still proves inferior to Archer in both yield and money value, but has a small advantage over the Goldthorpe, which may be attributed as stated above to the loss suffered by Goldthorpe in harvesting rather than to any heavier yielding power of the Scotch variety. Scotch Chevallier still shows a slightly earlier ripening habit than Archer. Throughout the season, and at all centres, it has stood well.

### COMPARISON OF ARCHER, GOLDTHORPE, AND STANDWELL.

Standwell was grown on two farms only and in both cases the average yield and money value were below that of Archer and Goldthorpe. At both centres much loss occurred owing to the ears breaking off when ripe; a large number of empty grains on each ear was also noticed.

Variety,	Average Yield of good Cora per Statute Acre.	Average Value of good Corn per Statute Acre.	Percentage of Screenings.	Average Total Value with Screenings.
	Brls, Sts.	£ s. d.		£ s. d.
Archer,	13 64	9 7 3	2.88	9 10 4
Goldthorpe,	12 21	8 10 10	3.24	8 14 1
Standwell,	11 64	8 1 5	3.15	8 4 2

COMPARISON OF ARCHER, GOLDTHORPE AND BEARDLESS.

Beardless was also grown on only two farms and the yield and value of this variety are compared with Archer and Goldthorpe at the same centres in the following Table:—

Variety.	Average Yield of good Corn per Statute Acre.	Average Value of good Corn per Statute Acre.	Percentage of Screenings.	Average Total Value with Screenings.
	Brls. Sts.	£ s. d.		£ s. d.
Archer,	14 9	11 0 5	5.34	11 7 2
Goldthorpe,	13 21	9 19 0	3.37	10 2 9
Beardless,	12 15	9 12 4	4.02	9 16 8
	1			

It will be seen that while the Beardless variety does not fall very far behind Goldthorpe it is considerably below Archer in both yield and money value per acre.

The barleys have this year been fairly free from fungoid and insect attacks.

Some Smut was noticed in Standwell. Care should always be taken to obtain seed from a crop which has been free from this disease, as the spores of Smut are carried on the outside of the grain.

A disease of the straw was noted on Hallett's at some centres and the weakness of the straw of this variety may be due to some extent to this attack. Wireworm attacked all plots more or less during the Spring but not to a serious extent. Rolling with a heavy roller was found very effective in stopping the ravages of this pest.

### MANURIAL TESTS.

# Series 2.—Small Scale Experiments.

These were carried out at two centres in County Cork. The following table shows the character of the soil and subsoil and the previous treatment of the land at each centre.

Experimenter.	Contre.	Character of Soil.	Previous Crops.
1. P. Kelleher, Co. Cork.	Clashduff, Midle- ton.	Good limestone loam. Subsoil — Yellow clay.	1903. Grass. 1904. Oata.
2. M. Murnane, Co. Cork.	Milltown, Midle- ton.	Good strong loam. Subsoil — Friable clay.	1903. Roots. 1904. Barley

The following Table shows the yield per Statute Acre, Price per Barrel, and the Profit or Loss per Acre resulting from the use of Artificial Manures alone and in combination.

		Sereenings per cent.		43	1	1	33	1	1		<b>8</b> 8	<b>0</b> 4d.
		Bushol Weight,	Lbs.	525	I		8	ł	1		:	<b>35</b>
	3 cwt. Kainit.	Value per Statute Acre.	£ 8, d.	7 1 1	0 3 6	7 4 7	7 10 0	0 2 104	7 12 10	7s. 4d.	:	:
	3 cw	Value per Barrel.	is. d.	14 9	<b>6</b> 0		14 6	8	1	2	:	:
		Tield per Statute Acre.	Bris. st.	6	0	10 0	10 64	0	<b>†11</b> 01		Profit,	Profit,
		Screenings por cent.		9.4	1		9.7	ı	1		r. 7d.	
	bate.	Bushel Weight.	Lbs	22	1	1	119	1	1		£1 08.	ž
, MOIII,	3 cwt. Superphosphate.	Value per Statute Acre.	£ 8. d.	6 0 9	0 4 6	6 5 3	0 6 9	0 3 0	5 12 0	34.	:	i
	wt. Sup	Value per Barrel.	s. d.	14 9	8	1	14 0	8	1	8	•	:
TOTAL TIME OF THE COMPUTATION OF	38	Yield per Statute Acre.	Bris. st.	eo 201	6	8 12	7 124	9 0	80 23		Loss,	Profit,
	خ	Screenings per cent		135	ı	1	6:5	ı	. 1		0 <u>\$</u> 4.	64.
3	momi	Bushel Weight.	Lbs.	52	1		<b>100</b>	1	ı		138.	18.
	1 cwt. Sulphate of Ammonia.	Value per Statute Acre.	£ 8. d.	6 6 11	0 11 0	6 17 11	5 5 1	0 4 43	5 9 5	. <b>4</b> }d.	:	:
	t. Salph	Value per Barrel	s. d.	9 71	<b>©</b>	1	13 6	8	!	148.		
	1 cw	Yield per Statute Acre.	- 4	8 13	1 6	10 2	7 124	8	¥9 8		Loss,	Loss,
		Screenings per cent.		5.5	1	ı	3.6	ı	1	:	n of	:
		Brabel Weight.	Lbs.	515	1	1	₹6 <b>9</b>	1	-1	:	pli <b>cat</b> ic	;
	No Manure.	Value per Statute Acre.		6 12 4	0 4 8	6 16 7	9 71 7	0 2 0	4 16 6	 •	from ap	:
	No F	Value per Barrel.	_	9 71	8	ı	13 9	0 8	ı	per Acre,	sulting i	ż
		Yield per Statute Acre.	œ	eq G	\$ 0	9 104	9 14	7 0	7 20	Cost of Manures p	Names:— Names:— Farm 1,	Farm 2,
	i i	FARK.	,	No. 1,	Screenings,	Total,	No. 2,	Screenings,	Total,	Cost of 1	Profit or Magura	Ei .

•.	l cwi	t. Sulphs swt. Sup	l cwt. Sulph <b>ake of Am</b> monia ; 8 cwt. Superphosphate.	monia hate.		1 cwt	. Sulpha 3 cw	I owt. Sulphate of Ammonia. 3 cwt. Kainit.	monia		1 evet	Sulpha wt. Sure 3 cwt	1 cvrt. Sulphate of Ammonia 3 cwt. Superphosphate: 3 cwt. Kainit.	monia tate ;		, e	wt. Sup	3 cwt. Superphosphate 3 cwt. Kainit.	ate ;	
FARK.	Tield per Strtute Acre.	Value per Barrel.	Value per Statute Acre.	Bushel Weight.	Sgrineerig Aneu teq	Yield per Stutute Acre.	Value per Barrel	Value per Statute Acre.	Bushel Weight.	Sereenings per cent.	Tield per Statute Acre.	Value per Barrel.	Value per Statute Acre.	Bushel Weight.	Sereenings per cent.	Yield per Statute Acre.	Value per Barrel.	Value per Statute Acre.	Bushel Weight.	per cent.
No 1,	Bris. st.	A. d. 14 6	£ 8. d.	Lbs 52	ည်	Brls. st.	s. d. 11 9	£ 8. d.	Lbs.	83	Brls. st.	s. d.	£ s. d. 7 12 3	Lbs.	<b>1.</b> 9	Brls. st. 8 11	8. d. 14 9	£ 8. d.	Lbs.	7
Screenings,	**************************************	<b>©</b>	6 <b>7</b> 0	ı	ı	0 104	<b>8</b> 0	0 5 14	ı	ı	₹6 0	8	6 7 0	1	ı	0 4	80	0 3 6	1	١
Total,	9 13	ı	6 18 11		i	₹ 6		6 11 6	1	1	11 13	1	7 17 0		ı	9 6	ı	6 14 5	1	ı
No. 2, Screenings,	9 3 <u>4</u> 0 10	14 3 8 0	6 11 5	116	£ 1	11 1 0 8	14 3	7 17 8	513	7-	11 6 0 7	14 6	8 <b>4</b> 11 0 3 6	53	3.7	9 13§	9 8	7 5 6	<b>33</b> 1	307
Total,	9 134	1	6 16 5	'	1	11 98	1	8 2 04			11 13	1	8 8 5		1	10 23		7 8 0	1	1
30 180)	of Manures	per Acre,	13	3s. 7hd.			1 13	1s. 8½d.				13	10s. 11\$d.	<u>.</u>			16s.	. 7d.		
Profit o Manus	Profit or Loss resulting from application of Manure:— £1 18. 34d.	sulting	from ap £1	plicati	on of	Loss,	;	13	23	10 <i>d</i> .	Loss,	:	:	£0 103.	647.	Loss,	:	03	186. 94	94.
	Farm 2, Profit,	ofit,	OF	£0 16s. 3ş	3şd.	Profit,	:	£3	34. 10d.	0·i.	Profit,	:		£2 0s.	.F\$11 .80	Profit,	:	ਸ਼ :::	£1 14s, 11d.	

### NOTES ON MANURIAL EXPERIMENTS.

These experiments were carried out on the same farms as last year, and the soils at the two centres varied in character in a similar manner to those of 1904. The soil at centre No. 1 was a light limestone loam in good condition, while that at centre No. 2 was much heavier in character and not in such a high state of fertility. The results generally confirm those obtained in previous years, but vary much at the two centres according to the fertility of the soil.

Sulphate of ammonia has given the same result as in previous years, except that owing to the dry summer there was not the excessive vegetation noted in former years, and consequently no loss was sustained by the corn becoming lodged. The value per barrel was less than that obtained on the unmanured plot and the percentage of screenings higher. This was the only manure which did not yield a profit at centre No. 2.

Superphosphate, while not greatly increasing the yield of barley, exerted a beneficial influence on the quality of the grain.

Kainit not only greatly influenced the quality of the grain, but the quantity produced at each centre was materially increased. At centre No. 1 this manure alone was the only one which showed a profit, while at centre No. 2 it showed the largest profit of any single manure or combination of manures in the series.

A mixture of sulphate of ammonia and superphosphate produced a slightly heavier yield than was obtained by the use of these manures singly.

Sulphate of ammonia and kainit together resulted in an increased yield at centre No. 2, but a decreased yield at centre No. 1.

On both farms the complete mixture of artificial manures has produced a larger increase in yield than any single manure or other mixture of manures. The profit resulting from the use of the complete manure is larger than that from a mixture of superphosphate and kainit, which indicates that although it is not advisable to apply sulphate of ammonia alone, it has a beneficial effect when used in conjunction with potassic and phosphatic manures.

Kainit and superphosphate together have not affected the yields so markedly as the complete mixture, but produced grain of slightly higher quality and with a smaller percentage of screenings.

The following Table shows the Profit or Loss obtained by the use of Artificial Manures in 1904 and 1905:—

Manure.	1 cwt. S of Am	ul <b>phat</b> e monia.	of Am	ulphate monia. Super- phate.	of Am 3 cwt. phosp	ulphate monia. Super- phate. Kainit.	phos	Super- phate. Kainit.
	1904.	1905.	1901.	1905.	1904.	1905.	1904.	1905.
	Loss.	Loss.	Loss.	Loss.	Loss.	Loss.	Profit.	Loss.
Farm No. I.,	s. d. 21 11	s. d. 13 0	в. d. 11 0	s. d. 21 34	s. d. 7 3	s. d, 10 6§		s. d. 18 9
	Profit.	Loss.	Profit.	Profit.	Profit.	Profit.	Profit.	Profit.
Farm No. II., .	s, d. 2 10	s. d. 1 5	i	1	s. d. 47 9	s. d. 40 114	ì	s. d. 34 11

### GENERAL REMARKS.

Too much stress cannot be laid on the thorough tilling of the land in spring and the preparation of a fine, clean seed-bed, thereby ensuring evenness in sowing. It is much more advisable to sow the corn later in a well prepared seed-bed than to sow it early in badly prepared ground.

The experiments of this year have demonstrated the great benefit to be derived from early sowing—the best barley was obtained from a centre at which the corn was sown in February. The experiments have also shown that a fine deep seed-bed is a most important factor in the successful growth of the barley crop.

During the past season charlock spraying experiments have been carried out at several centres, and the value of this operation for eradicating the charlock pest has again been demonstrated. At one centre the spraying was repeated at an interval of two days and the barley suffered no material damage, while a very vigorous crop of charlock was entirely destroyed. Full particulars of this operation may be obtained from the Department's leaflet No. 6—Charlock Spraying.

The Department desire to express their indebtedness to Mr. J. H. Bennett, Ballinacurra, Co. Cork, who ably directed the work, and to Messrs. A. Guinness, Son and Co., Ltd., who contributed the major portion of the cost of the experiments.

### II.—MEADOW HAY.

The experiments on the manuring of meadow hay in 1905 were exactly similar to those of the four preceding years. They were carried out at twenty-two centres in the counties of Antrim, Carlow, Clare, Down, Kildare, Londonderry, Meath, Tipperary N.R., Tyrone, Westmeath, Wexford, and Wicklow.

The plan of the experiment, with full details as to centres, manures applied, yield per acre, and estimated profits, is given in the table on page .

The following table summarises the results obtained: --

Plot No.	Manures Applied per Stature Acre,	yi Ha St	era, eld c y p atut	of e <b>r</b> e	d	crea .ue t inur	o	In 2s.	lue crea at 6d. 1 cwt.	80 )81		ost c inur		pre	ima ofit j atu Acre	er te
		T.	c.	Q.	т.	σ.	Q.	£	к.	đ.	£	8.	d.	£	8.	d.
1	No manure,	1	11	1				ļ	_			_			-	
2	Ten tons farmyard manure.	2	0	0	0	8	3	1	2	0	2	0	0	0	18 Loss	, 0
3	One cwt. Nitrate of Sods, 2 cwt. Superphosphate, 2 cwt. Kainit.	2	6	0	0	14	3	1	17	0	1	2	0	0	15	0
4	One cwt. Nitrate of soda, 2 cwt. Superphosphate.	2	2	1	0	11	0	1	7	6	0	17	0	0	10	6
5	One cwt. Nitrate of Sods.	1	18	3	0	7	2	0	18	9	0	10	6	0	8	3

The hay crop of 1905 was, on the whole, slightly heavier than in 1904, and the results obtained agree very closely with those of that year and of the three previous years in which the experiments were carried out. The figures in the above table show that on the average of all the centres the heaviest yield of hay was obtained on plot 3, to which was applied, at the rate of 5 cwt. per acre, a mixture containing each of the three important ingredients of manures, viz., nitrogen, phosphates, and potash. This is true not only of the average results, but also of the results obtained at each individual centre, with the exception of three or four. In these cases the highest yield was obtained on plots receiving either a dressing of 10 tons of farmyard manure or a mixture of 3 cwt. of nitrate of soda and superphosphate in the proportion of one to two.

The general result, therefore, indicates that the mixture applied on plot 3 may be relied on to give a substantial, and in most cases, a profitable increase in the crop.

# MEADOW HAY EXPERIMENT:--MANURIAL TEST FOR ONE YEAR.

Table showing the Returns per Statute Acre from each Centre.

Name and Address of Farmer.	County.	Character of Soil.	Plot 1. No Manure.	Plot 2.  10 tons Farm- yard Manure.	Plot 3.  1 cwt. Nitrate of Soda, 2 cwt. Superphosphate, 2 cwt. Kainit.	Plot 4.  1 cwt. Nitrate of Soda, 2 cwt. Superphosphate.	Plot 5.  1 cwt. Nitrate of Soda.
R. Gregg, Ballymena, Wm. M'Master, Carrick- fergus. J. Darcy, Tullow. Mr. Perrin, Borris. J. K. Halpin, New- market-on-Fergus. R. Gray, Holywood, J. M'Cullough, Comber, J. Forbes, Baltinghass, A. O'Connor, Celbridge, J. Brennan, Brannoxtown, J. Keenan, Castledawson, Wm. Thorpe, Coleraine, D. Corry, Ardeath, Wm. Madden, Tara, H. O. Langley, Thurles, J. P. Max, Thurles, R. Brown, Donaghmore, A. T. F. Briscoe, Killucan,	Antrim,  Oarlow,  Clare,  Down,  Kildare,  Meath,  Tipperary,  N.R.  Tyrone,  Westmeath.	Stiff loam, Medium loam, Limestone loam, Light loam, Clay loam, Alluvial, Strong clay, Good loam, Clay, Heavy loam, Medium loam, Light clay, Good clay loam, Loam, Loam, Heavy loam, Loam, Loam, Heavy loam,	1 2 1 2 2 2 0 19 0 2 11 0 0 17 2 2 3 0 1 5 2 1 18 0 2 16 3 1 0 0 1 8 3 1 17 0 1 11 3 2 3 3 1 9 2	T. C. Q. 2 9 3 1 19 1 1 17 0 1 16 0 2 8 2 1 0 2 3 0 0 1 5 0 3 1 0 2 11 0 2 3 0 1 6 0 1 9 1 2 10 3 1 15 2 2 17 2 1 17 0	T. C. Q. 2 12 2 1 19 3 1 16 1 1 19 2 2 17 1 1 5 1 3 5 0 1 12 0 2 14 0 2 13 0 2 14 3 3 2 3 1 5 1 2 1 1 3 1 2 3 0 1 2 14 1	T, C, Q, 2 8 0 1 19 0 1 11 2 1 18 0 2 15 0 1 5 2 3 7 0 1 7 0 2 11 0 2 14 0 2 10 1 3 0 0 1 10 3 1 19 0 2 5 0 2 8 1 2 11 1 2 0 2	T. C. Q. 2 3 0 1 18 0 1 8 3 1 11 2 2 8 2 1 6 0 3 3 0 2 6 9 2 13 0 2 5 1 1 10 2 2 2 3 2 1 2 2 19 3 1 13 2
M. Doyle, Tagoat, H. A. Lett, Enniscorthy, F. Neill, Stratford on-Slaney. D. Cullen, Roundwood,	Wexford, . ,, . Wicklow, .	Clay loam, . Clay, Sandy loam, . Sandy loam, .	1 0 2 1 12 2 0 15 0 0 16 0	1 14 3 1 17 1 1 0 3 0 18 3	2 11 3 2 4 0 1 12 0 1 6 2	1 9 3 2 0 1 1 8 0 1 12 2	1 3 0 1 17 2 0 19 0 0 19 3
Average yield per statut Increase due to Manurer Value of Increase: He per cwt. Cost of Manures. Estimated profit per sta	s,	- - -	111 1	2 0 0 0 8 3 £ s. d. 1 2 0 0 2 0 0 0 18 0	2 6 0 0 14 3 £ s. d. 1 17 0 1 2 0 0 15 0	2 2 1 0 11 0 £ s. d. 1 7 6 0 17 0	1 18 3 0 7 2 £ s. d. 0 18 9 0 10 6

On plot 4 the same mixture, but without the kainit, was applied, and in a few cases this was more profitable than the complete mixture. Such a result may be expected on land which is in good heart; but even then the increase in the hay crop does not fully represent the advantages derived from manures containing potash, as these are also seen in the after-grass where the growth of clovers and bottom grasses is stimulated by the use of such manures.

The following table shows briefly the results obtained during the past five seasons:-

	No Manure.	Ten tons of Farm- yard Manure.	One owt. Nitrate of Seda, 2 cwt. Super- phosphate, 2 cwt. Kainit.	One cwt. Nitrate of Soda, 2 cwt. Super- phosphate.	One cwt. Nitrate of Sods.
	T. C. Q.	T. C. Q.	T. C. Q.	T, C, Q.	T. O. Q.
1901 (Average yield per statute acre,	1 8 2	1 18 2 £ s. d.	2 8 3 £ s. d.	2 5 0 £ s, d.	1 16 3 £ s, d,
Estimated profit per acre, .	_	0 15 0 (Loss)	1 8 6	0 19 3	0 10 0
(Average yield per statute acre,	T. C. Q. 1 10 0	T. C. Q. 1 19 2	T. C. Q. 2 6 2 £ s. d.	T. C. Q 2 0 2	T. C. Q. 1 14 3
1902 Estimated profit per acre, .	_	£ s. d. 0 14 4 (Loss)	£ s. d. 1 1 0	£ s. d. 0 11 0	£ s. d. 0 3 3
(Average yield per statute acre,	T. C. Q. 1 9 0	T. C Q. 2 1 2	T. C. Q. 2 7 2	T. C. Q. 2 2 2	T. C. Q. 1 15 0
1903 { Estimated profit per acre, .	_	£ s. d. 0 8 9 (Loss)	£ s. d. 1 4 3	£ s. d. 0 16 9	£ s. d. 0 4 6
(Average yield per statute acre,	T. C. Q. 1 8 1	T. C. Q. 1 19 3	T. C. Q. 2 3 3	T. C. Q. 1 19 0	T. C. Q. 1 13 2
1904 Estimated profit per acre, .	_	£ s. d. 0 11 3 (Loss)	£ s. d. 0 16 9	£ *. d. 0 9 9	£ s. d. 0 1 6
Average yield per statute acro,	T. C. Q. 1 11 1	T. C. Q. 2 0 0 E s. d.	T. C. Q. 2 6 0 £ s. d.	T. C. Q. 2 2 1 £ s. d.	T. C. Q. I 18 3 £ s. d.
Estimated profit per acre, .	_	0 18 0 (Loss)	o 15 0	o 10 6	0 8 3

The use of nitrate of soda alone on plot 5 resulted in a profit of 8s. 3d. per acre, but is not to be recommended except under very exceptional circumstances.

The 10 tons of farmyard manure applied on plot 2 gave on the average the satisfactory increase of  $8\frac{3}{4}$  cwt. per acre, and, as mentioned above, in a few cases yielded the heaviest crop.

If the hay crop is charged with the full cost of the manure (4s. per ton) a loss of 18s. per acre is incurred; but if, on the other hand, only half the cost is charged to the hay crop, a profit of 2s. per acre is obtained.

The table on page 418 shows that in each year the heaviest yield and the greatest profit have been obtained from plot 3, and farmers may therefore be recommended to apply to their meadow lands the following mixture per statute acre:—

1 cwt. nitrate of soda, 2 cwt. superphosphate, 2 cwt. kainit.

### III.—POTATOES.

### A .- MANURIAL TEST.

The experiments on the manuring of potatoes carried out in 1905 were exactly similar to those of the four preceding years. The object of these experiments, which have been fully explained in previous reports, may be briefly stated, as an attempt to indicate what use can be made of artificial manures by way of supplementing applications of farmyard manure to the potato crop.

In Table I. (pp. 422-423) will be found the complete results of the experiments conducted at thirty-three centres in Counties Antrim, Armagh, Carlow, Down, Kildare, Kilkenny, Londonderry, Monaghan, Tipperary, Tyrone, Westmeath, Wexford, and Wicklow. In each county the experiments were under the direct supervision of the county agricultural instructor.

While the results obtained at individual centres will repay careful study, especially in view of the fact that the character of the soil and the variety of potato grown at each is given, yet, when drawing general conclusions, it will be safer to be guided in the main by the average results. For the sake of easy reference these are reproduced in the following table:—

Plot.	Manure applied per Statute Acre.	Average Total Yield of Potatoes per Statute Acre.	Increase due to Manures.	Cost of Manures.	Estimated Profit per Statute Acre.
1 2 3 4	No Manure, 20 tons Farmyard Manure, 15 tons Farmyard Manure, 15 tons Farmyard Manure,	Tons. Cwt. 4 13 10 3 9 1	Tons. Cwt.  5 10 4 8	£ s. d. 4 0 0 3 0 0	£ s. d. 6 13 0 5 11 0
5	1 cwt. Sulphate of Am- monia. 15 tons Farmyard Manure, 1 cwt. Sulphate of Am- monia. 4 cwt. Superphos-	9 16	5 3	3 12 6	6 9 6
6	phate.  15 tons Farmyard Manure,  1 cwt. Sulphate of Ammonia, 4 cwt. Superphosphate, 1 cwt. Muriate of	10 5	5 12	4 5 G	6 12 6
	phate, I cwt Muriate of Potash,	11 5	6 12	4 16 0	8 3 0

In calculating the profits obtained the following prices have been assigned to the different manures: -Farmyard manure, 4s. per ton; sulphate of ammonia, £12 10s. per ton; superphosphate, £3 5s. per ton; and muriate of potash, £10 10s. per ton. The figures in the above table are largely confirmatory of those obtained in previous years. Each application of manure, or mixture of manures, has produced a large increase in the crop. The influence of farmyard manure, however, has been more marked this year than in the four preceding years—a result which may be due to the great moisture-retaining properties of the dung, which are emphasised in an exceptionally dry year. While the artificial manures have yielded a considerable profit per acre, it is decidedly less than that obtained in 1904, as the table on this page shows. The dressing of 15 tons of dung has produced a crop only 22 cwt. less than that obtained when a heavier dressing is used, while when the lighter dressing is supplemented by the addition of 1 cwt. sulphate of ammonia the difference between the two plots is reduced to 7 cwt.

These experiments seem to fully justify the advice given in previous reports that, as a general rule, and especially where farmyard manure is limited in amount, farmers should apply the latter in more moderate quantities, and supplement it with suitable artificial manures. Now the question arises, What are the "suitable" artificial manures? An answer is furnished from the figures contained in the following table:—

Plot.	Manures applied per Statute Acre.			Incr over from tons I	à 15	in of	OXO	res ess ons	Est: P fron Art	rofi	t eof	fron Art	rofi a u	t se of ials
		Tons.	Cwt.	Tons.	Cwt.	£	8,	d.	£	8.	d.	£	8.	d.
3	15 tons Farmyard Manure, 15 tons Farmyard Manure,	9	1	-	-		_			<del>-</del>				
•	1 cwt. Sulphate of Am- monia.	. 9	16	0	15	0	12	6	0	18	6	o	13	6
5	15 tons Farmyard Manure, 1 cwt. Sulphate of Am- monia, 4 cwt. Superphos- phate,	10	5	,	4	,	×	R			R		16	R
6	15 tons Farmyard Manure, 1 cwt. Sulphate of Am- monia, 4 cwt. Superphos-		. •		•	•	•	•		•	•	•	7	•
	phate, 1 cwt. Muriate of Potash,	11	5	2	4	1	16	0	2	12	0	3	8	0

These figures show that the most suitable mixture of artificial manures that can be used to supplement a moderate application of dung is one which is complete, or, in other words, one which contains nitrogen, phosphoric acid, and potash. The questions as

to what quantity of each ingredient the mixture should contain, and in what form each ingredient should be present, may well constitute subjects for future investigation, but in the meantime farmers may safely be urged to try the mixture as applied to plot 6. This conclusion is very considerably strengthened when the results of last year's experiments are compared with those of similar experiments conducted during the four previous years, as given in the following table:—

	1901.	-	1902.	oj.			1904.	ų.	1906.	×
Manures applied per Statute Acre.	Total Yield of Potatoes per Acre.	Esti- mated Profit from use of Manures.	Total Yield of Potatoes per Acre.	Esti- mated Profit from use of Manures.	Total Yield of Potatoes per Acre.	Esti- mated Profit from use of Manures.	Total Yield of Potators per Acre.	Esti- mated Profit from use of Manures.	Total Yield of Potatoes per Acre.	Esti- mated Profit from use of Manures
	Tons, Cwt.	£ 8. d.	Tons. Cwt.	£ 8. d.	Tons. Cwt.	£ 8. d.	Tons. Cwt.	. a.	Tons. Cwt.	£ 8. d.
No Manure,	7	ı	7	1		ı	3 12	1	<b>4</b> 13	1
20 tons Farmyard Mannue,	10 13	8 11 0	80	4 16 0	oo	5 14 0	<b>8</b>	5 19 0	10 3	6 13
15 tons Farmyard Mannure,	9 16	7 14 0	7 19	8 9	6 2	5 9 0	91 1	5 4 0	6	6 11 0
15 tons Farmyard Manure, I cwt. Sulphate of Ammonia,	10 16	89 89	8	9 9	<b>8</b> 0	8 8	8 10	5 17 6	9 16	9 6 9
15 tons Farmyard Manue, 1 cwt. Sulphate of Ammonia. 4 cwt. Superphosphate,	11 12	10 3 0	91 6	9 8	9 10	9 61 . 00	6	6 19 6	10 6	6 12 6
is tons Farmyard Manner, I cwt. Suphate of Ammonia 4 cwt. Superphosphate, cwt. Muriate of Potash, Muriate of Potash,	12 1	10 1 0	10 11	7 5 0	10 6	0 8	10 9	8 10 0	11 6	8 3 0

# POTATO EXPERIMENT:-

TABLE I .- SHOWING THE RETURNS PER

				PLOT	1.
Name and Address of Farmer.	County	Character of Soil.	Variety of Potato.	No Man	ure.
				Saleable. Sma	l. Total.
Ml. Caldwell, Killagan, J. Morrison, Bushmills, J. Morrison, Muckamore, J. Reid. Graeshill, W. and A. Robinson, Crumlin.	Antrim,	Medium loam, Clay loam, Medium loam, Sand,	Up-to-date, Windsor Castle, Up-to-date,	tons. cwt. cwt. 1 3 8 8 3 14 3 15 7 2 17 16 3 11 23	tons. cwt.  1 11 3 17 4 2 3 13 4 14
W. Thompson, Crumlin, R. Soye, Lurgan, Wm. Green, Ballybreagh, R. R. Murphy, Lislea.	Armagh,	Clay. Loam. Heavy. Loam.	Black Skerries, Up-to-date,	2 0 23 2 6 11 6 0 12 6 13 18	3 3 2 17 6 12 7 11
P. Kelly, Myshall, J. O'Connell, Borris, J. Morrison, Killinchy, A. Finlay, Clandeboye.	Carlow, . Down, .	Slaty loam, Sandy loam, Loam, Clay loam,	Old Champion,	2 10 18 2 6 23 7 7 13 3 1 14	3 8 3 9 8 0 3 15
W. S. Young, Kirkeubbin. D. Dunne, Rathangan, J. Reddy, Piltown, J. Long, Ballyhale,	Kildare, Kilkenny,	Gravelly loam. Loamy, Strong loam, Medium loam.	Evergood, Champion, Maincrop, Old Champion,	6 2 21 0 10 15 2 2 10 3 7 42	7 8 1 6 2 12 5 9
J. Duff, Moneymore, Wm. Jameson, Eglinton, J. M. Farland, Dungiven, I. King, Ballybay,	Londonderry, .	Rich loam,	Evergood, Old Champion, Up-to-date,	13 13 57 1 0 26 3 10 15 6 17 18	16 10 2 6 4 5 7 10
R. Smyth, Carrickmacross, Rev. F. M'Kenns, Glasslough, J. W. Rockford, Nensgh, A. B. Sproule, Liskey,	Tipperary, N.R.	Light loam.	Old Champion, Langworthy. Up-to-date,	3 10 15 1 16 10 5 0 20 4 0 20	4 5 2 6 6 0 5 0
D. Keegan, Glasson, J. Casey, Ballinacargy, P. Cumasky, Ballinagore, J. Holmes, Delvin,	Westmeath,	Clay," Moor, Loam,	Champion,	0 14 25 4 17 32 0 11 85 0 0 49	1 19 6 9 2 6 2 9
Asylum Farm, Mullingar, I. Hill, Oamolin, N. Howlett, Ramsgrange, F. Neill, Stratford-on-Slaney,	Wexford, Wicklow,	Clay, Gravelly clay loam, Stiff clay, Light clay,	Up-to-date. Champion II Old Champion,	4 5 50 2 10 7 2 5 6 3 8 48	6 15 2 17 2 11 5 16
Average yield per s	tatute acre,			8 11 29	4 18
Increase due to M	(anures, .			-   -	-
Value of Increase:	Saleable Potatoe	s, 2s. per cwt. ; Small	. 1s. per cwt.		
Cost of Manures,				_	1
Estimated profit pe	r statute acre,			-	

# MANURIAL TEST.

### STATUTE ACRE FROM EACH CENTRE.

Pi	LOT 2				P	LOT 3	,			]	Plot ·	4.			1	l'lot (	5.			1	LOT	6.	
20 tons Man	Fa. ure.	r <b>my</b>	<b>s</b> rd	15	tons Mai	Fai nure.	rmye	ard	ŀ	M cwt.	s Fa anure Sulpl mmor	hate		1	cwt A	anure anure Sulp mmon Sup nate.	hate ia.	e of	1 4	ewi An ewi ph cwi	s Fa anure Sulp mmor Sup ate. Mu otash.	hate iia. erph	e of 108-
Saleable.	Small.	To	tal.	Sule	able.	Small.	To	tal.	Sale	able.	Small.	To	tal.	Sale	able.	Small.	T	otal.	Sale	able.	Small	T	ıtal.
tons. cwt.	ewt.	tons.	. cwt.	tons.	ewt.		tons.	ewt.	tons	. ewt.	ewt.	tons.	cwt.	tons	. cut.	ewt.	tons	. cwt	tons	ewt.	ewt.	tons	. cwt
6 9 8 2 10 6 10 18 15 17	31 16 39 27 31	8 12 12 17	0 18 5 5 8	6 9 9 13	8 15 6 16 1	20 8 39 37 23	7 7 11 11 14	8 3 5 13 4	8 12 10 14	8 14 2 18 6	15 8 35 27 31	8 9 13 12 15	3 2 17 5 17	9 13 12 15	15 2 9 5 3	26 16 31 23 15	8 9 16 13 15	1 18 0 8 18	10 10 13 13 15	8 14 17 16 5	25 8 31 21 23	11 -11 15 14 16	13 8 17 8
6 12 10 9 11 0 16 8	22 21 22 28	7 11 12 17	14 10 2 11	5 8 9 12	1 11 10 12	14 17 21 32	5 9 10 14	15 8 11 4	6 8 13 15	12 17 1 7	26 20 17 23	7 9 13 16	18 17 18 10	6 8 11 13	5 15 0 15	31 20 24 30	7 9 12 15	16 15 4 5	6 9 11 13	15 12 6 3	29 17 23 30	8 10 12 14	9 9 13
3 12 6 7 10 18 9 0	30 33 14 17	5 8 11 9	2 0 12 17	3 4 9 8	11 14 9 0	36 26 9 15	6 9 8	7 0 18 15	3 6 10 9	16 12 15 0	18 43 12 10	4 7 11 9	14 15 7 10	6 11 8	11 11 13 6	40 36 18 15	6 8 12 9	11 7 11 1	6 12 9	14 16 0 10	40 40 15 15	6 8 12 10	14 16 15 5
12 10 5 16 7 2 6 1	29 18 26 29	13 6 8 7	19 9 8 10	11 5 4 4	0 12 12 12	39 27 26 35	12 6 5 6	19 19 18 7	12 5 5 4	16 9 2 9	40 19 28 50	14 6 6 6	16 8 10 19	13 4 6 5	5 15 19 7	35 27 21 35	15 6 8 7	0 2 0 2	13 5 8 6	7 12 1 1	39 23 16 39	15 6 8 8	6 15 17 0
16 0 3 14 6 15 12 0	40 49 79 15	18 6 10 12	0 3 14 15	17 3 9 10	3 17 3 16	32 52 26 15	18 6 10 11	15 9 9 10	15 4 8 10	17 10 15 12	26 63 32 18	17 7 10 11	3 7 5	13 4 9 12	15 16 14 3	42 55 23 18	15 7 10 13	17 11 17 1	15 5 7 15	3 6 13 0	29 55 24 15	16 8 8 15	12 1 17 15
7 16 7 3 8 11 10 3	13 67 17 19	8 10 9 11	9 0 8 2	6 5 7 9	11 0 5 10	11 45 20 24	7 7 8 10	2 5 5 14	6 5 8 9	5 12 18 17	15 52 15 16	7 8 9 10	10 4 13 13	7 6 9 11	11 6 3	13 74 17 22	7 10 10 10 12	15 5 3 5	9 5 11 14	12 18 9 0	13 60 22 24	10 8 12 15	5 18 11 4
5 5 9 1 5 11 7 8	50 32 28 34	7 10 6 8	15 13 19 17	4 8 4 6	17 5 12 17	53 27 25 34	7 9 5 8	10 12 17 11	5 9 5 7	0 12 15 17	35 27 20 31	6 10 6 9	15 19 15 8	5 8 6 7	13 17 10 11	45 30 27 28	7 10 7 8	18 7 17 19	7 9 8 9	17 7 2 6	60 28 27 28	10 10 9 10	17 15 9 13
8 15 7 6 6 13 8 7	50 8 5 21	11 7 6 9	5 14 18 8	6 7 7 7	17 10 0 1	47 8 8 21	9 7 7 8	18 8 2	7 7 7	0 17 2 5	45 7 9 25	9 8 7 8	4 11 10	7 8 6 8	10 4 7 15	45 7 7 21	9 8 6 9	15 11 14 16	8 11 7 9	10 0 14 10	52 7 5 14	11 11 7 10	2 7 19 4
8 14	29	10	3	7	14	27	9	1	8	10	26	9	16	8	17	28	10	5	9	18	27	11	5
5 3	7	5	10	4	3	5	4	8	4	19	4	5	3	5	6	6	5	12	6	7	5	6	12
£ 10	8. 13	d. 0			£		d. 0			ی 10	s. 2	d. 0			£ 10	s. 18	d. 0			£ 12	s. 19	d. 0	
4	0	0			3		0			3	_	6			4	5	6			4	16	0	
6	18	0					0			8		6			R		6			8	8	0	

# POTATO EXPERIMENT:

TABLE II. -SHOWING THE RETURNS PER

			I	Briti	sh (	ue	n.	1	Black	s Sk	err	ies.		Cha	mpi	on I	II.	(	)l <b>d</b> (	Dhan	npio	a.
Name and Address of Farmer.	County.	Character of Soil.	-	Saleable.	Small.	Т	otal.		Saleable.	Small.	Т	otal.		Saleable.	Small.	Т	otal.		Saleable.	Small.	To	tal.
A. Park, Glarry-	Antrim, .	Peaty loam	ł	. cwt. <b>16</b>	ewt	10	. cwt	tns 8	3. cwt.	cwt	tni 9	s. ewt. 14	tns 9	. cwt	ewt	tans 9	. cwt.	tns.	cwt.	owt.	tns. 11	ewt.
ford. R. Suffern.		Clay loam,	12	0	38	13	18	7	1	45	9	8	8	17	16	9	13	8	12	49	11	1
Crumlin. T. Gray, Dillay,	Armagh.	Heavy,	13	6	26	14	12	7	12	32	9	4	10	6	27	11	13	12	0	43	14	3
R. R. Murphy, Lisles.	,, .	Loam,	13	10	25	14	15	9	16	30	11	ē	8	6	21	9	7	8	17	60	ii	17
T. G. Bryson, Mullentine.	, .	Heavy, .	13	3	17	14	0	9	13	12	10	5	7	18	14	8	12	9	10	31	11	1
P. Dowling, Tullow.	Carlow, .	Loam	5	19	57	8	16	4	7	39	6	6	5	13	25	6	18	2	14	71	6	5
M. Tuite, Borris, P. M.Grath,	Olare.	Light loam Peaty loam	6	15 15	50 60	9	5 15	6	18 13	30 24	6	8 17	6 11	10 6	21 11	7 11	11 17	5 9	15 2	63 19	8 10	18
Moyasta. T. M'Namara,	,, .	Clay loam.	6	18	66	10	4	6	3	21	7	4	10	5	17	11	2	5	11	83	9	14
Lissycasey. M. O'Neill,	, .	Light clay.	7	0	30	8	10	11	1	44	13		9	16	18	10	14	8	12	29	10	1
Newmarket- on-Fergus.	.,			-					_		Γ	-		_				ľ		-		-
W. J. Young, Castlewellan.	Down, .	Loam, .	13	2	48	15	10		-	-		-		-	-		-	6	4	104	11	8
W. S. Young, Kirkcubbin.	, .	Gravelly loam.	12	6	96	17	2		-	-		-		-	-		-	8	10	48	10	18
W. J. Finlay, Killinchy.	,, .	Clay loam.	15	7	27	16	14	8	16	28	10	4		-	-		-	10	11	42	12	13
A. M. Donald, Newtownards.		Gravelly loam.	11	5	76	15	1		-	-		-		-	-		-	7	8	61	10	9
J. Hanly, Naas, W. D. Baird,	Kildare, . London-	Lightloam	5 14	5	42 47	7 16	7 14	3	12 6	47 29	5	19 15	7 6	2 10	24 33	8	6 3	4 9	4 2	45 56	6 11	9 18
Co. Derry Asy- lum Farm.	derry.	loam.		•				-	•		Ī					ľ	Ť		-		-	
B.Whan, Money- more.	, .	Medium loam.	14	12	9	15	1	11	10	6	11	16 -	12	2	20	13	2	12	19	20	13	19
W. J. Hilton, Kilrea.		Medium loam.	8	9	36	10	5	7	12	35	9	7	9	3	26	10	9	8	10	33	10	3
Wm. Jamison, Eglinton.	,, •	Clay loam,	9	6	19	10	5	7	0	33	8	13	8	0	20	9	0	7	10	40	9	10
Rev.F. M'Kenna. Glasslough.	Monaghan.	Loam, .	10	3	59	13	2	5	16	26	7	2	8	0	25	9	5	6	8	64	9	7
Major Kings- cote, Newport	Tipperary, N.R.	Loam, .	7	0	70	10	10	5	10	55	8	5	11	10	115	17	5	7	0	70	10	10
J.Wolfe, Nenagh, J.S. M'Laughlin,	Tyrone,	Loam, Light clay,	6	17 2	58 16	9	15 18	5	10 10	20 33	6	10 3	9 11	7	2 19	9 12	9	7	16 4	49 47	10	5 11
Strabane.	,,	Light clay,	8	3	18	9	1	5	1	43	7	4	10	0	24	11	4	8	8	50	10	18
J. Moore, Don-	, .		13	1	20	14	1	7	14	46	10	0	12	7	23	13	10	10	11	60	13	11
aghmore. Asylum Farm,	W'meath,	Clay,	9	13	47	12	0	6	17	32	8	9	8	15	24	9	19	7	10	56	10	6
Mullingar. J. Hill, Camolin.	Wexford,	Gravelly		-	_		_	9	9	20	10	9	11	6	8	11	14	8	11	28	9	19
N. Howlett,	,, .	clay loam. Stiff clay,			_		_	6	7	14	7	1	6	4	10	6	14	5	6	25	6	11
Ramsgrange. J M'Grath, Ma-	Wicklow,	Sandy, .	16	11	19	17	10	8	15	9	9	4	9	15	4	9	19	12	13	29	14	2
nor-Kilbride. M. Toomey,	,,	-	13	13	9	14	2	9	5	19	10	4	11	4	19	12	3	9	5	48	11	13
Hollywood. L. Magrath,	, .	Clay,	7	6	29	8	15	4	7	29	5	18	9	5	29	10	14	7	16	19	8.	15
Arklow. M. Keenan,	, .	Light clay,	6	6	4	6	10	5	7	9	5	16	9	15	_	9	15	9	5	9	9	14
Round wood. G. J. Bodey,	,,	Sandy, .	8	15	19	9	14	10	14	39	12	13	11	14	29	13	8	8	15	29	10	4
Rathdrum. Rev. J. B. Willis,	, .	Sandy	12	3	19	13	2	2	8	29	3	17	12	3	9	12	12	10	14	39	12	13
Moyne Rec- tory. P. Kenny, Bally-	"•	Sandy	8	6	46	10	12	7	3	31	8	14	9	6	23	10	9	9	6	48	11	14
connell.  Average yield	norstatrt	loam.			70	10		-			-		_		-						-	
TAGER ATOR	r bet serene	in 1904,	18 10	2	38 47	12	8	7 5	0 17	29 20	8	9 17	9	9 10	21 25	10	10 15	8 7	6 2	46 32	10	12
	**	in 1903.		-	-		-	7	II	19	8	18	7	16	21	8	17	7	10	30	9	0
. , 11	*	in 1902. in 1901.		-	-		-	6	6	30	7	16	7	18	21	8	11	6	8	45	8	13
. 0	**	TT 190)			_			8	12	27	9	18	9	4	23	10	7	10	15	43	12	18

# VARIETY TEST.

# STATUTE ACRE FROM EACH CENTRE.

Bea	ut	y of	But	æ.		Up-	to-D	ate			Е	verg	000	l.			ches rn w			N	ortl	ıern	Sta	ır.		Lan	gwo	rthy	_
Saleable.		Small.	То	tal.		saleable.	Small.	То	tal.	Onlanti.	oanea ore.	Small.	Т	tal.	:	Saleable.	Small.	Tot	al.		Saleable.	Small.	То	tal.	Saleable,		Small.	Tota	d.
ins. cw		cwt.	tns.			ewt.	ewt		. cwt		cwt.	cwt.			tns	. cwt.	ewt.	tns. c	cwt.				1		tus. c	wt.	cwi,	tns. c	w
	6	28	10	14	10	18	32	12	10	13	10	32	15	2		-	-	-	•	8	3	20	9	8	-	•	•	-	
	6	31	12	17	12	0	31	13	11	11	6	42	13	8		-	_	-		5	8	26	6	14	l <sup>.</sup>		•	-	
13 1 11 1		48 41	16 13	2 16	14 12	19 4	29 41	16 14	8 5	14 10	18 1	36 53	16 12	14 14	16 12	12 2	18 43	17 14		14 12	0 2	45 65	16 15	5 7	10	- 8	21	11 -	9
10 1	6	27	12	3	14	2	12	14	14	13	3	17	11	0	15	19	22	17	1	14	2	28	15	10		-	-	-	
3 1	3	65	в	18	6	0	55	8	15		-			-	6	8	61	9	9	6	0	43	8	3		-	-	-	,
4 1 10 1		56 21	7 11	11 14	5 10	0 5	70	8 12	10	2	- 5	21	3	- 6	5	8	74	9	2	7 11	10 10	39 28	9 12	9 18		-	-	-	
	4	29	8	13	6	1	40	8	19	7	19	22	9	1		-				13	1	63	15	14			-		
7 1	- [	29		3	9	10	18	10	8	1	5	20	2	5		_				7	17	41	9	18				_	
• •	-	40	•	Ü		10	10	10	0	-	Ü	20	-	J						١.	•	-	1						
-		-		-	14	4	36	16	0	11	0	50	13	10	8	17	55	11	12	12	5	54	14	19	.	-	-	-	
-		-		-	16	0	30	17	10	10	15	46	13	1	11	2	23	12	5	8	18	65	12	3	'	-	-	-	
-		-		-	17	8	24	18	12	14	0	85	15	15	12	11	23	1	14	14	2	52	16	14	'	-	-	-	
		-		-	15	4	87	19	11	13	15	30	15	5	13	14	55	16	9	12	0	40	14	0	'	-	-	-	
5 1 11	2	63 43	13	3 5	11	2 13	63	11	6 16	3 15	9	46 52	18	15 1		-	-	-	-	4	18 19	35 39	6	13 18		-	=	-	
13	6	20	14	6	11	6	23	12	9	14	3	7	14	10	14	12	15	15	7	6	17	17	7	14		-	-	_	
8 1	0	33	10	3	8	19	50	11	9	9	3	55	11	18		-	-	-	•	6	12	35	8	7	.	-	-	-	,
13	0	22	14	2		-	-		-	12	0	24	13	4	11	7	35	13	2	6	5	19	7	4		-	-	_	
11	5	49	13	14	11	6	18	12	4	10	2	33	11	15	9	6	20	10	6	6	15	67	10	2		-	-	-	
7	0	70	10	10	8	5	80	12	5	4	0	40	6	0			-	-	-	9	10	95	14	5		-	-	-	
8 10 1	5	44 31	10 12	9 5	13	4	49 19	11 14	13	6 13	4 3	28 39	7 15	12	!	-	-	-		10 12	1	44 31	12 13	5 17	10	- 6	16	11	
9 1	- 1	34	11	7	16	8	20	17	8	10	0	83	14	3		_	_	١.	- ~	11	0	47	13	7	9	7	10		1
12 1	-	51	15	8	16	3	34	17	17	10	14	47	13	1		-	_	١.		14	17	34	16	11	12	16	25	14	1
9 1	7	50	12	7	11	2	35	12	17	10	0	37	11	17		-	-	١.	-	9	15	65	13	0		-	-	_	
13 1	4	11	14	5	13	0	15	13	15	9	19	16	10	15	İ	-	-	-			-	-		-		-	-	_	
5	9	14	6	3	8	7	10	8	17	4	3	19	5	2			-	-	-		-	-		-		-	-	-	
15 1	2	19	16	11	20	19	19	21	18	12	12	29	14	1	21	11	19	25	10	14	19	22	16	1		-	-	-	
8	5	2	8	7	15	3	19	16	2	13	13	9	14	2	9	5	19	10	4	8	5	19	9	4		-	-	-	
8 1	5	<b>3</b> 9	10	14	9	5	19	10	4	5	17	29	7	в	12	3	29	13	12	4	17	19	5	16	.	-	-	-	
5 1	7	-	5	17	4	17	4	5	1	13	3	9	13	12	5	7	9	5	18	13	13	4	13	17		-	-	-	
6 1	6	29	8	5	15	12	39	17	11	8	15	29	10	4	22	18	4	23	2	17	11	18	19	19		-	-	-	
19 1	3	29	14	2	16	1	14	16	15	11	4	19	13	3	17	1	19	18	0	16	12	9	17	1	-	-	•	-	
7 1	5	54	10	9	14	8	46	16	14	10	17	41	12	18	12	0	15	12	15	5	8	15	6	3	-		-	-	
9 i 7	7	35 34	11	6	11	18 12	35 26	13	13 18	10 7	10	33 25	11	14 15	12	14	29	14	3	10 10	2	38 20	12	0	10	14	18	II _	Į,
9	4	31	10	15	10	10	19	11	8	9	6	32	10	18		-	-	-	•		-	-		-	.	-	-	-	
8 I 10 :	7	32	10	8		14	24	9	18		-	-		-		-	-	-			-	-		-	-	•	-	-	
18 3	4	31	11	13	13	15	25	14	18		-	-		-		-	-	-	-		_	1	1	_	١.	-	_	-	

### B.-VARIETY TEST.

This experiment, designed to test the relative cropping capabilities of different varieties of potatoes, was conducted at thirty-five centres in Counties Antrim, Armagh, Carlow, Clare, Down, Kildare, Londonderry, Monaghan, Tipperary, Tyrone, Westmeath, Wexford, and Wicklow. The full returns of all the varieties grown at each centre are given in Table II. (pp. 424-425), together with the average yield per statute acre, and that of the same varieties in similar experiments conducted in the four previous years.

As all the varieties were not grown at each centre an accurate comparison between them cannot be drawn from the average figures stated in the table. Duchess of Cornwall (grown at nineteen centres) yielded the heaviest crop, next in order of yield coming Up-to-date (thirty-four centres); British Queen and Northern Star (both grown at thirty-three centres) with the same total crops, followed by Evergood (thirty-three centres), Langworthy (four centres), Beauty of Bute (thirty-one centres), Old Champion (grown at all centres), and Champion II. (grown at thirty-one centres). The lightest crop was obtained from Black Skerries, but the excellent cooking qualities of this potato compensate to some extent for its failure to yield a heavy crop.

It will be noticed that the average yield of Duchess of Cornwall for the whole number of centres exceeds that of Up-to-date—the next heaviest yielding variety, by 10 cwt. per acre. When, however, the averages of the yields at those centres only where the two varieties were grown together are compared, there is an advantage to the extent of 8 cwt. per acre in favour of the Up-to-date.

### IV.—MANGELS.

### A .- MANURIAL TEST.

This experiment was designed with the object of discovering some simple and profitable method of manuring the mangel crop,

and was carried out on eleven farms in the counties of Carlow, Clarc, Kildare, Tipperary, Waterford, Westmeath, Wexford, and Wicklow. The complete results of the experiment are shown in Table I. (pp. 430-431).

For convenience of reference the average results are reproduced in the following table:—

Plot	Manures applied per statute acre.	yi	rage leld acre.	du	rease e to ures		alud			ost anu		:	tima P <b>r</b> of	
1	No Manure,	tons		tons	cwt.	£	×.	ી.	٤	×.	ıl.	2	к.	d.
2	15 tons Farmyard Manure,	16	13	12	19	6	9	6	3	O	0	3	9	6
3 }	15 tons Farmyard Manure, 4 cwt. Superphosphate, .	19	8	15	11	7	17	.U	3	13	v	4	4	0
4	15 tons Farmyard Manure. 4 cwt. Superphosphate, . 2 cwt. Sulphate of Ammonia.	-21	3	17	9	8	11	6	4	18	0	3	16	6
5	16 tons Farmyard Manure, 4 cwt. Superphosphate, 2 cwt. Sulphate of Am- monia. 2 cwt. Kainit.	>23	13	19	19	9	19	6	5	3	0	4	16	6
6	15 tons Farmyard Manure, 4 cwt. Superphosphate, 2 cwt. Sulphate of Am- monia. 4 cwt. Salt,		10	20	16	10	8	0	5	2	0	5	6	0

Mangels require liberal treatment, and the results of this experiment prove that the farmer who applies dressings of suitable manures freely and largely is amply repaid.

On Plot 2 an application of 15 tons dung was given, and on each of Plots 3, 4, 5 and 6 a different mixture of artificial manures was added to this quantity of dung.

The effects of these different mixtures were as follows:—The addition of 4 cwt. superphosphate increased the crop to such an extent as to leave a profit of 14s. 6d. per acre from its use; the further addition of 2 cwt. sulphate of ammonia did not increase

the crop sufficiently to pay for the extra cost of the manure; while the still further addition of 2 cwt. kainit made up for this deficiency and left a profit of 12s. 6d. per acre more than was obtained from Plot 3. Hence it will be seen that, although the application of a good dressing of farmyard manure left a considerable profit, the addition of a complete mixture of artificial manures has increased that profit by 27s. per acre after paying for the cost of the manures.

On Plot 6, 4 cwt. salt was substituted for the 2 cwt. kainit applied on Plot 5, and at the majority of centres the salt gave the heavier crop.

On the average, the salt produced 17 cwt. per acre more than the kainit, and as the cost was practically the same in both cases, an increased profit of 9s. 6d. per acre is shown in favour of the salt. As the same result has been obtained in each of the past five years it would appear that as a rule mangels respond better to a dressing in which salt is included than to one in which kainit is included.

The following table gives the average yield obtained in the experiments conducted in 1901, 1902, 1903, 1904, and 1905:—

Plot.	Manures applied per acre.	yi	rage eld 1901.	Aver yie in 1	old	Aver yie in l	eld	Aver yie in l	old	Aver yie in 1	ld
1 2 3{	No Manure, 15 tons Farmyard Manure, 15 tons Farmyard Manure, 4 cwt. Superphosphate, 15 tons Farmyard Manure, 4 cwt. Superphosphate,	tons 15 26 27	13	tons 7 18 19	ewt. 1 0 7	tone 3 - 16 17	cwt. 3 5 13	tons 8 22 25	ewt. 8 3 8	tons 3 16 19	cwt. 14 13 8
5	2 cwt. Sulphate of Ammonia, 15 tons Farmyard Manure, 4 cwt. Superphosphate, 2 cwt. Sulphate of Ammonia, 2 cwt. Kainit, 15 tons Farmyard Manure,	33	12	24	18	24	6	<b>29</b>	17	23	13
6	4 cwt. Superphosphate, 2 cwt. Sulphate of Ammonia, 4 cwt. Salt,	36	11	25	12	25	10	31	18	24	10

### B.-VARIETY TEST.

This experiment, designed to test the cropping capabilities of different varieties of mangels, was carried out at eight centres in the following counties:—Kildare, Waterford, Wexford, and Wicklow. The full return of all varieties grown at each centre will be found in Table II. (pp. 430-431), together with the average yield per statute acre.

Prize Winner and New Triumph yielded the heaviest crops, next in order of yield coming Windsor Prize Taker, followed by Mammoth, Yellow Globe, Crimson Tankard, Long Red, and Golden Tankard and Golden Globe which were practically equal.

# MANGEL EXPERIMENT:-

### TABLE I .- Showing the RETURNS PER

				Plot 1.
Name and Address of Farmer.	County.	Character of Soil.	Variety of Mangel.	No Manure.
				tons cwt.
T. Nixon, Carlow,	Carlow, .	Gravelly loam.	Yellow Globe, .	7 9
W. Doyle, Tullow, .	, ,	Peaty loam	Yellow Globe, .	4 0
J. O'Donnell, Newmarket-on-	Clare, .	Clay loam .	Yellow Globe, .	1 16
T. Brooks, Leixlip,	Kildare, .	Loam,	Yellow Globe, .	12 0
G. Bourke, Newport,		Loam	Yellow Globe	- :
T. Nolan, Kilmeaden, .	N.R. Waterford,	Loam,	Yellow Globe, .	0 15
J. Killian, Rathowen, .	Westmeath,	Clay loam, .	Yellow Globe, .	3 3
J. Holmes, Delvin, .		Loam, .	Yellow Globe, .	2 15
D. M'Donald, Camolin, .	Wexford, .	Shingly,	Yellow Globe, .	2 9
E. Kehoe, New Ross, .	· ,,	Gravelly clay,.	Yellow Globe, .	2 8
W. Carr, Wicklow,	Wicklow,	Olay, .	Yellow Globe, .	4 3
Average yield per	statute acre,		• • •	3 14
Increase due to	Manures,			-
Value of the Incre	ase : Mangel e	stimated at 10s. pe	er ton,	-
Cost of Manures,				-
Estimated profit	er statute acre	,		-

# MANGEL EXPERIMENT:— TABLE II.—Showing the Returns per

#### Character of Soil. Yellow Prize Name and Address of Farmer. County. Globe. Winner. tons cwi. tons cwt. U. Campbell, Mageny, . Kildare, Clay loam, 29 0 33 0 T. Nolan, Kilmeaden, Waterford, Loam, 28 0 27 11 J. B. A. Bosanquet, Portlaw. Loam, 29 5 31 12 Wexford, D. M. Donald, Camolin, . Shingly, . 16 0 16 16 E. Kehoe, New Ross. Gravelly clay, 22 6 27 17 •• W, Carr, Wicklow, Wicklow. Olay, 22 14 27 15 P. J. Byrne, Ashford, Light clay, 17 13 25 15 F. Neill, Stratford-on-Slaney, Light clay, 22 3 18 7 Average yield per statute acre, 23 26 2

MANURIAL TEST.

# STATUTE ACRE FROM EACH CENTRE.

	Plot 2.	Plot 3.	Plot 4.	Plot 5.	Plot 6.
	15 tons Farmyard Manure.	15 tons Farm- yard Manure, 4 cwt. Super- phosphate.	15 tons Farmyard Manure. 4 cwt. Super- phosphate. 2 cwt. Sulphate of Ammonia.	15 tons Farmyard Manure. 4 cwt. Superphosphate. 2 cwt. Sulphate of Ammonia. 2 cwt. Kainit.	15 tons Farmyard Manure. 4 cwt. Superphosphate. 2 cwt. Sulphate of Ammonia. 4 cwt. Salt.
Ī	tons ewt.	tons ewt.	tons ewt.	tons cwt.	tons ewt.
	16 0	19 7	19 14	20 19	20 8
	20 6	23 14	24 6	27 6	30 9
	14 14	18 7	18 14	20 2	19 1
	19 15	21 0	21 10	29 0	<b>32</b> 0
1	13 3	15 4	16 18	18 6	19 10
	19 8	22 2	25 17	27 15	28 18
İ	12 9	11 0	12 2	13 2	14 3
	16 12	19 17	20 13	24 10	24 7
	10 8	16 11	18 18	21 13	21 11
	25 14	26 14	28 3	29 4	29 11
	14 12	19 13	25 15	28 5	30 G
	16 13	19 8	21 3	23 13	24 10
	12 19	15 14	17 9	19 19	20 16
	£ s. d. 6 9 6	£ s. d. 7 17 0	£ s. d. 8 14 6	£ s. d. 9 19 6	£ *. d. 10 8 0
	3 0 0	3 13 0	4 18 0	5 3 0	5 2 0
	3 9 6	4 4 0	3 16 6	4 16 6	5 6 0

# VARIETY TEST.

# STATUTE ACRE FROM EACH CENTRE.

Orimso T <b>ank</b> ar		Gold Tank		Mamn	aoth.	Long	Red		d <b>sor</b> Taker.	Ne Triu		Gold Glo	
 tonsew		tons		tons		1		tons			cwt.	1	ewt.
22 1	•	24	0	28	5	21	0	30	10	30	5	24	0
21 17	7	24	7	23	12	24	17	25	5	24	10	-	
29 1	L	25	8	28	0	27	10	-		32	10	28	15
15 1	5	11	12	18	12	14	18	18	18	18	15	16	0
22	8	21	11	23	3	21	13	26	12	24	2	23	2
20 1	4	22	14	24	15	25	5	28	5	30	6	17	13
22	1	22	14	24	4	22	14	27	15	26	5	22	4
24 19	9	21	4	22	3	17	8	21	13	21	13	20	14
22	9	21	14	24	2	22	6	25	11	26	1	21	15

### V.—OATS.

### MANURIAL TEST.

The experiment on the manuring of oats in 1905, which was similar to those of the four previous years, was carried out at twenty-two centres in Counties Antrim, Armagh, Carlow, Down, Kildare, Kilkenny, Londonderry, Monaghan, Tipperary, Westmeath, and Wexford.

The object of these experiments has been to test the effects of artificial manures when used singly and in combination, and the complete results are given in the Table on pp. 434-435.

For the sake of easier reference the average figures are reproduced in the following table:—

Plot	Manures applied per Statute Acre.			Yield te Acre.		ease Ianu	due to res.	'	alu of		Co Ma	ost		Pro		
Ă,	DESTRUCTION.	Gra	in.	Straw.	Gra	in.	Straw.	Inc	rea	40.			0.51		Ler	
		Owt.	Qr.	Cwt.	Cwt.	Qr.	Owte	£	8.	d.	£	8.	đ.	£	8.	d.
1	No manure,	15	2	23	-	-			-			_			_	
2	1 cwt. Sulphate of Ammonia.	18	0	27	2	2	4	0	19	6	0	12	6	0	7	0
3	3 cwt. Superphosphate, .	17	3	26	2	1	3	6	16	6	0	9	9	0	6	9
4	3 cwt. Kainit,	16	3	25	1	1	2	0	9	6	0	7	6	0	2	0
5	1 cwt. Sulphate of Ammonia, 3 cwt. Superphosphate,	20	3	31	5	1	8	2	0	0	1	2	3	0	17	9
6	1 cwt. Sulphate of Am- monia, 3 cwt. Superphos- phate, 3 cwt. Kainit,	21	1	33	5	3	10	2	5	6	1	9	9	ŋ	15	9

The effect of the application of the different manures was less marked this year than in previous seasons, a result due most probably to the exceptionally dry year. It will be seen from the table (p. 433) giving the comparative yields of grain and straw respectively during the five years in which the experiments have been conducted, that while the yield of grain in this year's experiments does not show any appreciable decrease, the quantity of straw produced is very much smaller than that obtained in 1902, 1903, and 1904.

The mixtures applied on plots 5 and 6 have invariably given profitable returns, but in the case of plots 2, 3, and 4, on which sulphate of ammonia, superphosphate and kainit, respectively, were applied, the returns have been irregular: sometimes profitable, sometimes not. Even during the past season, at a few individual centres these manures, when applied singly, failed to produce any increase in the crop.

The mixture of sulphate of ammonia and superphosphate applied on plot 5 increased the crop to such an extent as to leave a profit of 17s. 9d. per acre from its use, while the same mixture, with the addition of kainit, as applied on plot 6, resulted in a profit of 15s. 9d. per acre. As was mentioned above, these two mixtures have given satisfactory returns in each of the four years during which the experiment has been tried in this country, but the profit from plot 5 has, for the first time, exceeded that from plot 6—a result which may be accounted for by the very dry season rather than the direct influence of the manures.

While, therefore, farmers cannot always rely on getting a profitable increase in crop from the use of sulphate of ammonia, superphosphate or kainit when applied alone, yet they may be fairly confident of realising a substantial profit when all three are used together in the same proportions as they were applied on plot 6.

The figures referring to the past four years' experiments are given side by side in the following table:—

Plot.	Manure applied per Statute	AV	erag in 1	e yield 901.	Av	erag in li	e yield 102.	Av	erag in 19	e yield 903.	Av	erag in l	e yield 004.	Λv	e <b>rag</b> in l	e yield 905.
_	Acre.	Gr	in.	Straw.	Gn	sin.	Straw.	Gre	in.	Straw.	Gra	in.	Straw.	Gre	ain.	Straw.
		Cwt	Qr.	Cwt	Owt.	Qr.	Cwt.	Cwt	Qr.	Cwt.	Owt	Qr.	Cwt.	Owt	. Qr.	Owt.
1	No Manure, .	13	1	22	17	0	30	14	0	26	15	1	28	15	2	23
2	1 cwt. Sulphate of Ammonia, .	16	1	27	19	3	34	15	2	29	18	3	34	18	0	27
8	3 cwt. Super- phosphate, .	16	0	27	18	0	33	16	2	27	18	0	30	17	3	26
4	3 cwt. Kainit, .	14	0	24	18	0	30	15	0	26	17	2	29	16	3	25
5	1 cwt. Sulphate of Ammonia, 3 cwt. Super- phosphate, .	19	0	33	21	1	36	19	0	33	21	1	37	20	3	31
6	1 cwt. Sulphate of Ammonia, 3 cwt. Super- phosphate, 3 cwt. Kainit,*.	20	1	35	23	0	40	. 21	0	38	22	3	41	21	1	33

# OAT EXPERIMENT—

TABLE showing the Returns per

			·	Plot	1.
Name and Address of Farmer.	County.	Variety of Oat.	Character of Soil.	No Mar	ure.
				Grain.	Straw.
R. Park, Glarryford,	Antrim.	l'oland.	Peaty Loam.	Cwt. Qr.	Owt.
D. Patterson, Dervock, .	,,		Medium Loam.	17 1	24
A. Price, Ballycastle,		"	Peaty Loam.	15 2	30
W. G. Gray, Markethill,	Armagh, .	Tom Finlay.	Clay,	18 2	26
F. Austin, Portadown,		Lightfoot,	Heavy Loam,	19 1	24
P. Kehoe, Tynock, Kiltegan,	Carlow,	Black Tartarian	Sandy Loam,	12 0	11
M. Walsh, Killedmond,	,, .	,,	Peaty Loam,	14 3	15
T. C. Mogaw, Poyntzpass,	Down,	Lightfoot,	Gravelly Loam,	15 2	15
Mrs. Dunne, Sallins,	Kildare,	Black Tartary,	Light Gravel,	11 3	15
John Phelan, Glenmore, .	Kilkenny,	,,	Medium Loam,	15 <b>2</b>	22
E. Comerford, Bullockhill,	,,	,,	Strong Loam,	13 0	20 .
Wm. Jamison, Eglinton,	London-	Potato,	Light Loam,	12 8	13
Wm. Jamison, Eglinton, .	derry.	,,	Medium Loam,	18 3	33
Wm. Jamison, Eglinton, .	,, •	,	Heavy Clay	7 2	20
P. Conlan, Latton, .	Monaghan,	9,	Loam. Light gravelly,	14 1	19
H. Harrison, Castleblayney,	,,	,,	Loam,	16 3	22
J. Mulligan, Latnamard, .	, .	,, .	,,	18 0	35
J. T. Max, Thurles,	Tipperary, N.R.	Storm King, .	"	18 3	24
D. Keegan, Glasson, .	Westmeath,	Potato,	,,	17 2	25
Mrs. Nugent, Moate,	, .	Waverley, .	Gravelly Loam,	11 0	14
D. M'Donald, Camolin, .	Wexford,	Tawny (winter)	,,	20 3	85
M. Lacey, Wexford,	, .	Black Tartary,	Gravelly Clay,	17 2	83
Average yield per Sta	tute Acre.			15 2	28
Increase due to Manu	res, .			_	-
Value of Increase : G	ain at 8d. per	stone and Straw a	t 1s. 6d, per Cwt.,	_	_
Dost of Manures,	• •			_	_
Estimated Profit per	Statute Acre,			•••	_

# MANURIAL TEST.

Statute Acre from each Centre.

Straw.   Cwt. 48   27   33   34   36   13   16   23   20   23	3 Cw pho  Grain  Cwt. 19 17 19 21 12	sph	Straw.  Cwt. 43 26 31 27	19		Straw.	1 Cwt. of Am 3 Cwt phos Grain. Cwt.	Qr.	nia. per- ite. Straw.	of A 3 Cv ph 3 Ov Grai	vt. Si osph vt. K	Straw
Cwt. 48 27 33 34 36 13 16 23 20	Owt. 19 19 17 19 21	Qr. 3 1 2 1	Owt. 43 26 31 27	Owt. 19	Qr. 3	Cwt.	Owt.	Qr.	Cwt.	Owt.		
48 27 33 34 36 13 16 23 20	19 19 17 19 21	3 1 2 1	43 26 31 27	19 17	3			- 1			Qr.	Cwt
27 33 34 36 13 16 23 20	19 17 19 21 12	1 2 1 1	26 31 27	17		46	99					1
38 34 36 13 16 23 20	17 19 21 12	2 1 1	31 27		2	1		0	. 52	24	0	53
34 36 13 16 23 20	19 21 12	1	27	20		24	23	0	31	25	0	36
36 13 16 23 20	21 12	1		۱	0	31	24	2	40	24	1	45
13 16 23 20	12			18	3	30	21	1	28	22	3	28
16 23 20		1	36	19	0	30	22	3	40	20	1	39
23 20	17		12	12	0	11	14	2	14	15	1	17
20	20	2	23	14	1 2	22 18	17 22	2	24 28	21 18	1 3	25 25
	14	3	15	14	0	15	15	1	18	19	2	22
. 23	19	0	24	16	0	22	19	2	26	20	1	28
												26
	1	_	1			1	i	-			-	25
1	1				-		1				_	47
22	1	_	23			'	11	3	l		0	34
22	13	0	16	12	2	16	16	2	21	25	0	34
28	19	2	24	20	0	26	22	3	30	26	0	34
38	21	3	42	20	0	40	20	3	44	23	2	45
25	19	0	22	22	0	28	22	3	27	24	2	29
25	20	2	29	18	1	23	22	0	33	18	3	34
12	12	1	18	14	0	16	21	2	21	13	0	16
35	24	1	40	20	0	33	27	2	44	26	2	48
36	18	3	35	18	0	34	23	2	41	21	3	38
27	17	8	26	16	3	25	20	3	31	21	1	33
4	2	1	3	1	1	2	5	1	8	5	3	10
P	e		F p 3	e -	.7	P	c ·	đ	C	£		£ 8. d
060	0 12	a. 0	0 4 6			0 8 0	1 8	<i>a</i> . 0	0 12 0	1 10	и. В	0 15
6	0	9	9	0	7	6	1	2	3	1	9	8
0	n	R	9	0	2	0	0	17	9		15	9
	22 28 38 25 25 12 35 36 27 4 £ s.d. 0 6 0	17 19 41 20 22 8 22 13 28 19 38 21 25 19 25 20 12 12 35 24 36 18  27 17 4 2 E s. d. £ s. 0 6 0 0 12	17	17	17     19     1     23     14       41     20     0     32     18       22     8     1     23     10       22     13     0     16     12       28     19     2     24     20       28     21     3     42     20       25     19     0     22     22       25     20     2     29     18       12     12     1     18     14       35     24     1     40     20       36     18     3     35     18       27     17     3     26     16       4     2     1     3     1       £     k. d.     £     k. d.     £     s. d.       0 6 0     0     12     0     0     4     6     0     6       6     0     9     9     0	17     19     1     23     14     0       41     20     0     32     18     1       22     8     1     23     10     3       22     13     0     16     12     2       28     19     2     24     20     0       38     21     3     42     20     0       25     19     0     22     22     0       25     20     2     29     18     1       12     12     1     18     14     0       35     24     1     40     20     0       36     18     3     35     18     0       27     17     3     26     16     3       4     2     1     3     1     1       £     k. d.     £     k. d.     £     s. d.       0 6 0     0     12     0     0     4     6     0     6       6     0     9     9     0     7	17     19     1     23     14     0     15       41     20     0     32     18     1     31       22     8     1     23     10     3     27       22     13     0     16     12     2     16       28     19     2     24     20     0     26       38     21     3     42     20     0     40       25     19     0     22     22     0     28       25     20     2     29     18     1     23       12     12     1     18     14     0     16       35     24     1     40     20     0     33       36     18     3     35     18     0     34       27     17     3     26     16     3     25       4     2     1     3     1     1     2       £     s. d.     £     s. d.     £     s. d.     £     s. d.       0     0     0     0     0     6     0     3     0	17       19       1       23       14       0       15       20         41       20       0       32       18       1       31       24         22       8       1       23       10       3       27       11         22       13       0       16       12       2       16       16         28       19       2       24       20       0       26       22         38       21       3       42       20       0       40       20         25       19       0       22       22       0       28       22         25       20       2       29       18       1       23       22         12       12       1       18       14       0       16       21         35       24       1       40       20       0       33       27         36       18       3       35       18       0       34       23         27       17       3       26       16       3       25       20         4       2       1       3       1 <td< td=""><td>17     19     1     23     14     0     15     20     1       41     20     0     32     18     1     31     24     3       22     8     1     23     10     3     27     11     3       22     13     0     16     12     2     16     16     2       28     19     2     24     20     0     26     22     3       38     21     3     42     20     0     40     20     3       25     19     0     22     22     0     28     22     3       25     20     2     29     18     1     23     22     0       12     12     1     18     14     0     16     21     2       36     18     3     35     18     0     34     23     2       27     17     3     26     16     3     25     20     3       4     2     1     3     1     1     2     5     1       £     8     d     £     8     d     £     8     d     £     8     <td< td=""><td>17       19       1       23       14       0       15       20       1       25         41       20       0       32       18       1       31       24       3       41         22       8       1       23       10       3       27       11       3       33         22       13       0       16       12       2       16       16       2       21         28       19       2       24       20       0       26       22       3       30         38       21       3       42       20       0       40       20       3       44         25       19       0       22       22       0       28       22       3       27         26       20       2       29       18       1       23       22       0       33         12       12       1       18       14       0       16       21       2       21         36       18       3       35       18       0       34       23       2       41         27       17       3       26&lt;</td><td>17       19       1       23       14       0       15       20       1       25       18         41       20       0       32       18       1       31       24       3       41       24         22       8       1       23       10       3       27       11       3       33       17         22       13       0       16       12       2       16       16       2       21       25         28       19       2       24       20       0       26       22       3       30       26         38       21       3       42       20       0       40       20       3       44       23         25       19       0       22       22       0       28       22       3       27       24         26       20       2       29       18       1       23       22       0       33       18         12       12       1       18       14       0       16       21       2       21       13         36       18       3       35       18       0</td><td>17       19       1       23       14       0       15       20       1       25       18       2         41       20       0       32       18       1       31       24       3       41       24       0         22       8       1       23       10       3       27       11       3       33       17       0         22       13       0       16       12       2       16       16       2       21       25       0         28       19       2       24       20       0       26       22       3       30       26       0         38       21       3       42       20       0       40       20       3       44       23       2         25       19       0       22       22       0       28       22       3       27       24       2         25       20       2       29       18       1       23       22       0       33       18       3         12       1       18       14       0       16       21       2       21       13</td></td<></td></td<>	17     19     1     23     14     0     15     20     1       41     20     0     32     18     1     31     24     3       22     8     1     23     10     3     27     11     3       22     13     0     16     12     2     16     16     2       28     19     2     24     20     0     26     22     3       38     21     3     42     20     0     40     20     3       25     19     0     22     22     0     28     22     3       25     20     2     29     18     1     23     22     0       12     12     1     18     14     0     16     21     2       36     18     3     35     18     0     34     23     2       27     17     3     26     16     3     25     20     3       4     2     1     3     1     1     2     5     1       £     8     d     £     8     d     £     8     d     £     8 <td< td=""><td>17       19       1       23       14       0       15       20       1       25         41       20       0       32       18       1       31       24       3       41         22       8       1       23       10       3       27       11       3       33         22       13       0       16       12       2       16       16       2       21         28       19       2       24       20       0       26       22       3       30         38       21       3       42       20       0       40       20       3       44         25       19       0       22       22       0       28       22       3       27         26       20       2       29       18       1       23       22       0       33         12       12       1       18       14       0       16       21       2       21         36       18       3       35       18       0       34       23       2       41         27       17       3       26&lt;</td><td>17       19       1       23       14       0       15       20       1       25       18         41       20       0       32       18       1       31       24       3       41       24         22       8       1       23       10       3       27       11       3       33       17         22       13       0       16       12       2       16       16       2       21       25         28       19       2       24       20       0       26       22       3       30       26         38       21       3       42       20       0       40       20       3       44       23         25       19       0       22       22       0       28       22       3       27       24         26       20       2       29       18       1       23       22       0       33       18         12       12       1       18       14       0       16       21       2       21       13         36       18       3       35       18       0</td><td>17       19       1       23       14       0       15       20       1       25       18       2         41       20       0       32       18       1       31       24       3       41       24       0         22       8       1       23       10       3       27       11       3       33       17       0         22       13       0       16       12       2       16       16       2       21       25       0         28       19       2       24       20       0       26       22       3       30       26       0         38       21       3       42       20       0       40       20       3       44       23       2         25       19       0       22       22       0       28       22       3       27       24       2         25       20       2       29       18       1       23       22       0       33       18       3         12       1       18       14       0       16       21       2       21       13</td></td<>	17       19       1       23       14       0       15       20       1       25         41       20       0       32       18       1       31       24       3       41         22       8       1       23       10       3       27       11       3       33         22       13       0       16       12       2       16       16       2       21         28       19       2       24       20       0       26       22       3       30         38       21       3       42       20       0       40       20       3       44         25       19       0       22       22       0       28       22       3       27         26       20       2       29       18       1       23       22       0       33         12       12       1       18       14       0       16       21       2       21         36       18       3       35       18       0       34       23       2       41         27       17       3       26<	17       19       1       23       14       0       15       20       1       25       18         41       20       0       32       18       1       31       24       3       41       24         22       8       1       23       10       3       27       11       3       33       17         22       13       0       16       12       2       16       16       2       21       25         28       19       2       24       20       0       26       22       3       30       26         38       21       3       42       20       0       40       20       3       44       23         25       19       0       22       22       0       28       22       3       27       24         26       20       2       29       18       1       23       22       0       33       18         12       12       1       18       14       0       16       21       2       21       13         36       18       3       35       18       0	17       19       1       23       14       0       15       20       1       25       18       2         41       20       0       32       18       1       31       24       3       41       24       0         22       8       1       23       10       3       27       11       3       33       17       0         22       13       0       16       12       2       16       16       2       21       25       0         28       19       2       24       20       0       26       22       3       30       26       0         38       21       3       42       20       0       40       20       3       44       23       2         25       19       0       22       22       0       28       22       3       27       24       2         25       20       2       29       18       1       23       22       0       33       18       3         12       1       18       14       0       16       21       2       21       13

### VI.—TURNIPS.

### A .- MANURIAL.

Two separate experiments on the manuring of the turnip crop were carried out in 1905, similar to those of 1901, 1902, 1903, and 1904. The objects of the experiments were:—

- (1.) To test the effects of artificial manures used alone.
- (2.) To test the effects of artificial manures in combination with farmyard manure.

The experiment designed to test the effects of artificial manures used alone was carried out on twelve farms in Counties Armagh, Carlow, Down, Kildare, Tipperary, and Wexford. The detailed results will be found on Table I., pp. 438-439.

The fact that phosphatic manures are all-important to the successful growth of turnips is so well known among farmers that it is unnecessary to call attention to the results obtained on plot 2, to which superphosphate was applied at the rate of 4 cwt. per statute acre, the crop produced being such as to leave an estimated profit from the use of the manures of £3 6s. per acre.

From a comparison of the figures referring to plots 2, 3 and 4, an opinion can be formed as to the advisability of adding nitrogenous and potassic manures to the superphosphate. On plot 3 the addition of 1 cwt. sulphate of ammonia did not increase the crop sufficiently to pay for the extra cost of the manure, and no advantage can therefore be claimed from its use; but the further addition of 3 cwt. kainit on plot 4 enabled the farmer to obtain an increased profit of 6s. 6d. and 15s. respectively per acre over that obtained from the use of superphosphate alone and of superphosphate and sulphate of ammonia together. The inference to be drawn from these figures is that more satisfactory returns, both as to yield of crop and as to profit, are likely to be got from the use of a complete mixture of manures than from the use of an incomplete mixture. There is so little to choose between the

returns from the two complete mixtures used on plots 4 and 5 that the extra labour involved in handling the more complex mixture applied on plot 5 is scarcely justified.

The second experiment, designed to test the effects of the addition of artificial manures to farmyard manure, was carried out on twenty-one farms in Counties Antrim, Carlow, Down, Kildare, Monaghan, Waterford, Westmeath, and Wexford. The results of this experiment are shown on Table II., pp. 440-441.

The application of 20 tons of dung (see plot 2) may be regarded as a standard dressing, and one which is very generally relied on, and it was the object of the experiment to determine whether equally heavy crops could be obtained on farms where the supply of dung is necessarily limited, by supplementing a lighter dressing of farmyard manure with suitable artificial manures. A comparison of the yields obtained on plots 2 and 4 shows that where 4 cwt. superphosphate was used along with 10 tons of dung, a slightly heavier crop was obtained than where the dung was applied alone at the rate of 20 tons per acre. In the experiments of 1904, 1903, and 1902 a similar result was obtained, while in 1901 the balance was in favour of the heavier dressing of dung to the extent of half a ton of turnips per acre. There seems little doubt, therefore, that where farmyard manure is scarce, farmers may rely on obtaining a perfectly satisfactory crop of turnips by using a lighter dressing of dung and supplementing it with an application of about 4 cwt. superphosphate per acre. The experiment was further intended to show whether other forms of artificial manure (nitrogenous and potassic) could be profitably applied along with the superphosphate (see plots 5 and 6). The returns from individual centres are so contradictory on this point that conclusions drawn from the average figures are apt to prove misleading.

Where land is in fairly good condition, it is very doubtful whether the use of manures containing nitrogen and potassium can be recommended, but on land which is naturally poor, or is in low condition, it is probable that such manures will pay for their application.

The two tables ((1) and (2)) on page 444, show the average results obtained in these experiments in 1901, 1902, 1903, 1904, and 1905.

# TURNIP EXPERIMENT.—MANURIAL

TABLE I.—Showing the Returns

Name and Address of Farmer.	County.	Character of Soil.	Variety of Turnip.	
R. Soye, Lurgan,	Armagh, .	Loam,	Abundance, .	
T. Byrne, Glynn,	Carlow, .	Sandy Loam, .	Purple-top Swede,	
R. Lyttle, Donadoney	Down, .	Clay Loam, .	Improved Purple	
J. Campbell, Donaghadee,	,, .	Heavy Loam, .	Abundance, .	
J. Dunn, Lisburn,	, .	Loam,	Purple Top,	
J. Nolan, Baltinglass,	Kildare, .	Light Loam, .	.,	
C. Callan, Naas,	,, .	Boggy,	•,	
S. Liffey, Cloughjordan,	Tipperary, N.R.	Loam,	Sutton's White Swede.	
J. Wolfe, Nenagh,		,, -	Purple-top Swede,	
E. O'Shea, New Ross,	Wexford, .	Gravelly Loam,	, .	
W. Lett, Ferns,	, ,	,, •	"Champion" Pur- ple-top Swede.	
M. Doyle, Tagoat,	, .	Clay Loam, .	Purple-top Swede,	
Average Yield per Statute	Acre,			
Increase due to Manures,				
Value of Increase : Turnip	es at 8s. per ton.	• , • •		
Cost of Manures,		• • •		
Estimated Profit per Stat	ute Acre, .	• • •		

439

# TEST (WITHOUT FARMYARD MANURE).

per Statute Acre from each Centre.

	Plot 1.	Plot 2.	Plot 3.	Plot 4.	Plot 5.
	No Manure.	4 Cwt. Superphos- phate.	4 Cwt. Super- phosphate 1 Cwt. Sulphate of Ammonia.	4 Owt. Super- phosphate, 1 Owt. Sul- phate of Ammonia, 3 Owt. Kainit.	2 Cwt. Superphosphate, 2 Owt. Pure Dissolved Bones, 1 Cwt. Bone Flour, 4 Cwt. Sulphate of Ammonia, 2 Cwt. Kainit.
	Tons Owt.	Tons Cwt.	Tons Cwt.	Tons Cwt.	Tons Cwt.
	19 0	25 10	25 0	28 9	27 19
	8 0	18 15	19 1	24 10	25 13
	15 10	26 18	27 1	30 0	33 15
	16 5	24 10	25 6	27 7	29 5
	21, 8	80 0	30 2	30 8	32 13
	8 0	17 0	14 15	<b>20</b> 0	22 0
1	2 0	7 5	8 15	14 0	10 0
	0 0	12 15	14 5	19 10	18 0
	1 0	9 5	12 0	13 0	12 10
	9 9	19 19	19 18	20 2	21 7
	9 4	22 9	23 15	24 8	<b>23</b> 15
	0 0	14 2	14 2	16 13	15 12
	9 3	19 1	19 10	22 7	22 14
	-	9 18	10 7	13 4	18 11
	-	£ s. d. 3 19 0	£ s. d. 4 3 0	£ s. d. 5 5 6	£ s. d. 5 8 6
	-	0 18 0	1 5 6	1 18 0	1 14 0
	_	3 6 0	2 17 6	8 12 6	3 14 6

# TURNIP EXPERIMENT.—MANURIAL TABLE II.—Showing the Returns

Name and Address of Farmer.	County.	Character of Soil.	Variety of Turnip.
			·
H. J. Clarke, Ballymena,	Antrim, .	Heavy Loam, .	Abundance, .
Wm. M'Master, Carrickfergus, .	, .	Medium Loam,	M'Causland's Spe-
Wm. M'Neill, Bushmills,		Light Loam, .	cial. Abundance, .
D. Patterson, Dervock,	, .	Medium Loam, .	
J. R. Warwick, Doagh,		,,	Paragon,
Mr. M'Ardle, Hacketstown,	Carlow, .	Sandy,	Tait's X L All,
J. Murphy, Tullow,	, .	Medium Loam, .	Magnum Bonum
R. Little, Donacloney,	Down, .	Clay Loam, .	Improved Purple
J. Campbell, Donaghadee,	, .	Moory Loam, .	Top. Abundance,
J. Dunn, Lisburn,	" .	Loam,	Purple Top,
J. Langan, Donadea,	Kildare,	Rich Loam, .	,,
I. King, Ballybay,	Monaghan, .	Gravelly Loam,	Magnum Bonum,
P. Conlan, Latton,	" •	,	Improved Purple
M. Walsh, Rathgormack,	Waterford, .	Loam,	Top. Best-of-All,
T. Nolan, Kilmeaden,	,,	,,	Improved Purple
J. Casey, Ballinacargy,	Westmeath,	Loamy Clay, .	Top. Purple-top Swede,
P. Cumaskey, Ballinagore,	"	Moor,	,, •
J. Killian, Rathowen,	,, .	Loam,	,,
E. O'Shea, New Ross,	Wexford, .	Gravelly Loam,	,, .
Wm. Lett, Ferns,	,, .	,, , .	"Champion" Pur-
M. Doyle, Tagoat,	,, ,	Clay Loam, .	ple Top. Purple-top Swede,
Average yield per Statute A	.ere, .		
Increase due to Manures,			
Value of Increase : Turnips	at 8s. per ton,		
Cost of Manures, .			
Estimated Profit per Statut	e Acre, .		

441

# TEST (WITH FARMYARD MANURE).

per Statute Acre from each Centre.

	Plot 1. No Manure.	Plot 2. 20 Tons Farmyard Manure.	Plot 3. 10 Tons Farmyard Manure.	Plot 4.  10 Tons Farmyard Manure, 4 Cwt. Super- phosphate.	Plot 5.  10 Tons Farm-yard Manure, 4 Cwt. Sul-phate of Ammonia.	Plot 6. 10 Tons Farm- yard Manure, 4 Owt. Super- phosphate, 1 Owt. Sulphate of Ammonia, 3 Owt. Kainit.
	Tons Owt	Tons Cwt.	Tons Owt.	Tons Cwt.	Tons Cwt.	Tons Cwt.
	4 0	27 19	27 2	27 8	28 9	28 14
	0 0	24 3	23 0	28 3	29 9	29 19
	0 0	26 11	20 0	28 11	30 14	34 6
	0 0	14 9	7 1	25 2	26 9	27 19
	0 0	16 13	13 17	14 14	15 18	18 7
	12 0	21 5	18 3	24 1	24 8	24 17
	12 1	28 1	27 12	29 10	30 6	30 1
	15 10	<b>30</b> 0	25 0	29 18	30 1	<b>3</b> 0 3
	16 5	27 2	<b>2</b> 5 12	25 19	27 10	29 5
	21 8	<b>36</b> 16	<b>3</b> 0 S	81 3	34 17	38 4
	10 0	21 0	20 5	23 0	24 0	23 5
	3 11	24 2	18 10	25 18	<b>26</b> 10	29 0
	1 6	14 8	9 4	19 8	20 0	20 15
	9 1	19 10	17 12	22 1	22 5	<b>23</b> 0
	0 0	<b>3</b> 5 2	32 8	36 4	33 15	36 11
	4 8	20 5	18 15	21 7	22 6	22 17
	4 12	16 18	13 17	92 4	23 1	23 11
	10 6	21 0	20 18	21 16	20 11	23 12
	9 9	<b>23</b> 6	20 17	<b>22</b> 12	21 15	23 5
	9 4	25 13	24 0	26 5	27 13	<b>26</b> 15
	0 0	18 7	15 9	19 11	16 10	17 6
	7 8	23 9	20 9	25 0	25 11	26 15
	-	16 6	18 6	17 17	18 8	19 12
	-	£ s. d. 6 10 6	£ s. d. 5 6 6	£ s. d. 7 8 0	£ s. d. 7 7 0	£ s d. 7 17 0
•	-	4 0 0	<b>3</b> 0 0	2 13 0	3 5 6	8 13 0
	-	2 10 6	8 6 6	4 10 0	4 1 6	4 4 0

# B .- VARIETY TEST.

The object of this experiment was to test the cropping capabilities of different varieties of swedes and yellow turnips.

The experiment was conducted on fifteen farms in Counties Antrim, Carlow, Down, Kildare, Monaghan, Waterford, and

# TURNIP EXPERIMENT .-

TABLE III.—Showing the Returns per

												-
Name and Address of Farmer.	County.	Character of Soil.	Car	ling stle.	Pui To	n- ved rple op.	ph	e- ant.	gaz	an- '00.		t of 11.
			T.	C.	T.	C.	T.	C.	T.	C.	T.	C.
R. Moore, Coleraine, .	Antri <b>m</b> , .	Loam, .	27	7	28	19	24	19	26	3	29	3
J. M'Master, Carrickfergus,	,, ,	Medium Loam,	30	18	30	18	27	19	31	2	30	14
J. Darcy, Tullow,	Carlow, .	" .	24	15	27	10	26	16	24	15	26	15
R. Shannon, Loughbrick-	Down, .	Loam, .	35	10	33	15	36	5	36	7	39	11
Col. Sharman - Crawford, Crawfordsburn.	, .	Clay Loam, .	36	13	37	5	35	0	87	6	37	18
Viscount Bangor, Castle- ward.	" .	Gravelly Loam	19	0	22	5	14	10	19	10	23	10
Mrs. Dunny, Athy,	Kildare, .	Limestone Gravel.	12	15	15	0	13	10	13	5	14	0
H. Harrison, Castleblayney,	Monaghan		26	0	22	14	26	10	26	2	28	14
F. M'Hugh, Carrickmaeross	,, .	Gravelly Loam	-	-	22	11	26	7	24	18	25	1
T. Kieran, Carrickmacross,	"•	Medium Loam,	19	4	18	7	18	14	21	12	23	11
P.Cunningham, Latnamard,	" .		16	5	18	7	18	10	24	10	19	15
T. Ward, Carrickmacross,	,, .	, ,	16	2	15	15	14	0	19	0	18	14
M. Walsh, Rathgormac, .	Waterford	Loam, .	19	5	20	7	17	5	21	17	22	0
J. B. A. Bosanquet, Portlaw,	" .	Shingly Loam,	29	15	29	18	29	8	84	11	39	2
E. O'Shea, New Ross, .	Wexford,	Gravelly Loam	19	14	24	1	20	12		-	22	6
Average Yield per Stat	ute Acre,		23	16	24	10	23	7	25	16	26	14
Average Yield per Sta	tute Acre in	a 1904,	26	8	25	16	25	17	25	1	27	5
Average Yield per Stat	uie Acre in	1903,	25	11	25	19	24	4	24	18	26	5
Average Yield per Stat	ute Aore in	1902,	19	15	20	11	19	16	22	6	23	11
Average Yield per Stat	u <b>te Ac</b> re in l	1901,	22	16	22	6	22	5	25	6	27	9

Wexford. The first nine varieties on the list are swedes and the rest are yellow turnips. The figures referring to each centre, together with the average results obtained with all varieties tested in the past five seasons, will be found on Table III. below.

VARIETY TEST.
Statute Acre from each Centre.

Magnum Bonum.	Triumph.	Queen Bwede.	Deflance.	Aberdeen Green Top.	Centenary,	Fosterton Hybrid.	Purple Top.	Achilles
(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
<b>T.</b> C.	т. О.	T. C.	т. с.	T. C.	T. C.	T., C.	т. с.	т. с.
28 3	81 18	24 0	24 16	31 2	41 16	40 5	32 14	81 6
<b>30</b> 18	29 19	26 15	24 12	_	37 13	36 0	<b>30</b> 18	35 2
27 19	26 11	24 14	24 16	_	-	_	_	_
<b>37</b> 15	82 14	38 5	39 2	41 0	60 10	48 1	42 17	45 16
<b>3</b> 8 6	38 0	35 15	<b>3</b> 3 11	34 3	42 17	83 11	34 13	<b>3</b> 3 0
26 10	16 0	17 10	20 0	27 0	29 0	26 0	29 11	25 0
12 10	14 15	11 5	14 5	-	-	-		-
28 18	25 15	28 5	27 5	35 4	45 4	41 10	<b>83</b> 18	42 5
24 8		-	_	22 10	-	25 5	26 8	_
18 8	21 2	18 14	20 11	16 17	18 15	17 5	19 18	15 14
22 14	18 8	18 5	14 5	_	-	-	_	-
19 2	15 10	-	-	-	-	-	-	-
22 0	22 1	19 14	20 0	<b>9</b> 2 11	27 11	22 18	19 11	26 14
39 0	32 12	32 18	26 10	24 5	36 0	29 17	27 8	26 15
20 18	21 11	-	21 3	28 5	25 16	20 13	24 6	-
26 10	24 15	24 13	23 18	28 6	36 10	31 0	29 6	81
27 11	26 19	98 14	25 6	30 7	36 16	<b>3</b> 0 16	80 8	28 1
25 14	25 18	28 1	25 0	28 8	86 16	29 17	28 2	81
28 6	24 8	20 0	19 16	20 3	27 4	24 5	20 8	23 1
27 12	94 7	_	26 6	24 10	_	24 17	22 1	22 1

### (See last paragraph on page 437.)

# (1.) Artificial Manures used alone.

Manure.	Yield per Statute Acre in 1901.		Yield per Statute Acre in 1902.		Yield per Statute Acre in 1903.		Yield per Statute Acre in 1904.		Yield per Statute Acre in 1906.	
	Tons.	Owt.	Tons.	Owt.	Tons.	Cwt.	Tons.	Cwt.	Tons.	Owt.
No Manure,	4	10	5	11	2	2	4	9	9	3
4 cwt. Superphosphate, .	19	8	17	12	14	7	20	7	19	1
4 cwt. Superphosphate, 1 cwt. Sulphate of Ammonia,	22	9	18	10	15	1	21	18	19	10
4 cwt. Superphosphate, 1 cwt. Sulphate of Ammonia, 3 cwt. Kainit.	23	14	23	5	18	6	94	18	22	7
2 cwt. Superphosphate, 1-cwt. Sulphate of Ammonia, 2 cwt. Kainit, 2 cwt. Dis- solved Bones, 1 cwt. Bone Flour, .	24	8	23	13	19	9	<b>2</b> 5	3	22	14

# (2.) Artificial Manures used in combination with Farmyard Manure.

Manure.	Yield per Statute Acre in 1901.		Yield per Statute Acre in 1902.		Yield per Statute Acre in 1908.		Yield per Statute Acre in 1904.		Yield per Statute Acre in 1905.	
1 to reduce of the present of the pr	Tons.	Cwt.	Tons.	Cwt.	Tons.	Cwt.	Tons.	Owt.	Tons.	Cwt.
No Manure,	5	8	5	14	2	4	5	15	7	3
20 tons Farmyard Manure, .	23	19	22	16	19	3	26	8	23	9
10 tons Farmyard Manure, .	19	4	17	14	14	5	22	4	20	9
10 tons Farmyard Manure, 4 cwt. Superphosphate, .	23	10	23	9	20	9	27	0	25	0
10 tons Farmyard Manure, 4 cwt. Superphosphate, 1 cwt. Sulphate of Ammonia,	24	5	25	12	21	19	<b>28</b>	16	25	11
10 tons Farmyard Manure, 4 owt. Superphosphate, 1 cwt. Sulphate of Ammonia, 3 owt. Kainit,	24	13	27	6	23	13	29	7	26	15

Copies of these Reports in leaflet form (Nos. 36 to 41) may be obtained free of charge, and post free, on application to the Secretary, Department of Agriculture and Technical Instruction for Ireland, Upper Merrion-street, Dublin. Letters of application so addressed need not be stamped.



Branch showing leaves, wood, and fruit attacked with American Gooseberry Mildew.

### AMERICAN GOOSEBERRY MILDEW.

During the past few years the gooseberry crop in some parts of Ireland, more especially Counties Down, Antrim, and Derry, has suffered from the attacks of a fungoid pest known as the American Gooseberry Mildew (Sphaerotheca mors-uvae). This disease has, probably, been introduced from America, where it causes much loss to gooseberry growers.

The mildew occurs in America on many species of the gooseberry genus (kibes). In this country (in Co. Occurrence. Kilkenny) it has been noticed on the red current. Though observed in Russia and Sweden, it has not yet been noticed on gooseberry plants in England. Irish growers should, therefore, do their best to stamp out the pest, or the cultivation of gooseberries may in the future become a matter of some difficulty.

In its early stages of attack the disease forms a flour-like coating on the leaves, twigs, and young fruits. Appearance. Later, the white covering looks like a rusty brown cobweb overgrowth, readily recognisable on the berries. In the flour-like stage the fungoid body consists of branching, cotton-like threads growing on the gooseberry plant, sending into its surface-cells minute suckers, and sending out from its own surface innumerable upright threads which end in chains of spores or conidia. The spores fall off easily and are carried by the wind or other means to other gooseberry plants and berries, which thereby become infected by the pest. mildew may make its first appearance before the end-buds of the gooseberry shoots have burst, and when the ordinary green leaves are only half opened. It may destroy the young shoots completely and cause great injury to the older shoots, so that no buds are formed for the following season, and the plant itself becomes so damaged as to succumb to the winter weather. As the white mealy stage gives place to the rusty brown one the chains of spores disappear, and in the dark web-like overgrowth other fruiting bodies make their appearance. These, with the dark web on which they grow, make the gooseberries very unsightly and quite unfit for use, causing them often to become shrivelled and misshapen. It is in the form of the dark web-like growth, chiefly on the young shoots of the plants, that the fungus passes through the winter. The fruiting bodies produced are well protected by a thick brown coat, and each body contains eight spores. In the spring they burst, and the spores escape to attack the gooseberry plant and form on it the floury coating.



Burst fruit (ascocarp) showing bag of eight spores. The appendages on the fruitwall are shortened.

(Much enlarged).



A chain of conidia or spores on erect thread of the floury (early summer) stage.

Figure shows one conidium detached.

(Much enlarged).

As the mildew is a surface fungus and is easily recognisable by the characteristics described above, growers

Prevention and should have no difficulty in noticing its first appearance. The safest step is to uproot and burn the attacked bush. Failing this,

the plant should be sprayed thoroughly with a solution of potassium sulphide (not sulphate) in the proportion of one ounce to two gallons of water, and this treatment should be repeated at intervals of a fortnight. For subsequent sprayings, however, a stronger solution may be used, viz.:—two ounces of potassium sulphide dissolved in three gallons of water.

As the fungus exists during the winter on the branches and young twigs, the bushes should be given close spur pruning. The

cuttings should be raked together and burnt. All the diseased and suspected plants should be sprayed in January with caustic spray (prepared as recommended in the Department's leaflet No. 55). As soon as the young leaves appear they should be thoroughly sprayed with a weak solution of the potassium sulphide (one ounce to two gallons). This should be repeated at intervals of two weeks until the berries are well developed. When possible the gooseberries should be gathered green, and the stronger solution (two ounces of potassium sulphide in three gallons of water) at once applied to the plants.

Growers in doubt as to the presence of this or any other disease should send specimens to the Department for identification.

Copies of this article in leaflet form (No. 76) may be obtained free of charge, and post free, on application to the Secretary, Department of Agriculture and Technical Instruction for Ireland, Upper Merrion-street, Dublin. Letters of application so addressed need not be stamped.

## "REDWATER" OR "BLOOD MURRAIN" IN CATTLE\*.

This disease is unfortunately very common in many districts throughout Ireland, and it frequently causes serious loss to owners of cattle.

When an animal is attacked by this disease the following symptoms are plainly noticeable:—The usual The Symptoms. signs that the animal is unwell—such as loss of appetite: the inclination of the animal, if at grass, to separate itself from its companions: the urine is usually dark in colour, varying from light red to chocolate or even approaching black.

In many cases the affected animal is not passing a proper quantity of dung, and if this condition continues, so that there is great constipation, stockowners frequently speak of it as "dry murrain." This condition is dreaded by experienced herds when it accompanies the "blood-murrain" or "red-water."

As the disease progresses it is noticed that the animal wastes very rapidly, even one in good condition becoming very thin and weak.

The eye soon becomes deeply sunk in the head. The beast is usually not inclined to move about, but prefers to stand with its back arched, and if compelled to move does so more or less stiffly.

If the "dry murrain" gets a firm hold there will soon be noticed a painful grunt, and if relief is not afforded death usually follows.

It has been satisfactorily proved within recent years that this disease is really a blood disease. It is unnecessary in this leaflet to describe the nature and composition of blood. It must suffice to state that in a healthy animal the

blood consists of a fluid in which float very small red bodies.

In "redwater," however, some of these bodies have been destroyed, and being now useless they are thrown out by the kidneys. It is their red colour which gives the urine of affected animals its characteristic colour.

<sup>\*</sup> See Journal for January, 1906, Vol. VI., No. 2, page 248.

It may be asked "What destroys these red bodies?" It is believed that they are attacked by small creatures of a parasitic nature, and that these parasites get into the blood in a very surprising manner, namely, by the bite of the common ticks, which are the chief, if not the only, carriers of the disease.

Ticks are frequently found in large numbers about the lower parts, thighs and udders, of cattle on grass. Such cattle are not always affected with "redwater," but if "redwater" exists amongst animals on a pasture, it may be spread by means of these ticks, since healthy ticks are liable to get the infection from a sick animal and convey it to others.

In the past certain kinds of soil and certain herbs were regarded as the cause of "redwater," but it is now definitely known that the disease may be met with on any pasture where there is suitable shelter for the ticks which carry the infection.

The lands most usually infested with this disease are those on the surface of which there is found a large amount of vegetation.

Thus, old pasture lands for years untilled, where, perhaps, grass is left for some time uncut, or not sufficiently grazed down, or where clumps of bushes and brambles have been allowed to spring up; where, as is too frequently the case, fences have been allowed to run wild; and again, where grass has been spared during summer to afford "winterage" for cattle.

All such lands are liable to become infested with the disease because they provide the necessary shelter for the ticks.

It has been noticed that cattle which have been brought from a distance to an infected farm are more likely to take "redwater" than those which have been bred on the farm.

From what has been said, it will be understood that in order to banish this disease from a farm it will be Precautionary necessary to pay increased attention to the Measures. care of the land.

If other means fail it will generally be found that tillage of the rough pasture has a marked effect in lessening the possibility of the animals being attacked by "redwater." Where the tillage is not convenient, to take a crop of hay fairly early in the season is useful, provided, that the aftergrass be grazed as soon as possible, and never allowed to grow too long. In rough, stony land, where meadowing is not practicable, bushes and brambles, and rank spots with overgrown fences, should be cleared.

A top-dressing of about 3 tons of lime or of 10 cwts. of salt, per statute acre, has been found of service in lessening the number of cases on land so treated. Crushed rock salt suitable for this purpose can be obtained at Carrickfergus, Co. Antrim, in quantity at 8s. per ton, free on rail there.

The treatment of this disease is by no means simple, and owing to the serious complications which so frequently

Treatment of arise, stockowners will be wise if they call in veterinary advice as early as possible.

It must be remembered that the blood, on which life depends, is being practically destroyed by the parasites introduced by the tick. Therefore it is not sufficient to depend, as so many do, upon violent and repeated doses of purgative medicines. Such treatment of the stomach or bowels, or of the kidneys, is directed against the symptoms and often misses the true seat of the disease—which is the blood.

Nursing in this as in other diseases is very important, as while the constipation makes it advisable to avoid giving solid food, yet the rapid wasting makes it necessary to try and maintain strength. For this purpose it is well to give good well boiled oatmeal gruel, boiled flax-seed; even milk, eggs, ale, and stout, may sometimes be profitably used.

Copies of this article in leaflet form (No. 63) may be obtained free of charge, and post free, on application to the Secretary, Department of Agriculture and Technical Instruction for Ireland, Upper Merrion-street, Dublin. Letters of application so addressed need not be stamped.

### FORESTRY.

### VII.\*—FELLING AND SELLING TIMBER.

The amount of profit which attends the growing of timber of any kind depends greatly upon its being cut or felled at the proper time. This will vary, not only with the species, but also with the soil and situation upon which the trees were grown, with the local or general markets, and upon the development of individual trees. In the case of all healthy trees, the annual increase of wood in the trunks, or boles, which takes place during the summer, adds to the value of the trees up to a certain point, beyond which the value either remains stationary, or commences slowly to decrease. It remains stationary so long as the timber already formed continues sound and unaffected by age and does not exhibit any forms of decay or deterioration which might prevent it from being put to its proper use. The value decreases when such deterioration takes place, or when the size of the trees exceeds that at which they can be profitably handled or converted. As an instance of timber neither increasing nor decreasing in value, oak or pine trees may be mentioned which have ceased to add materially to their bulk, but in which the quality of the timber continues to increase slightly by the conversion of sapwood into heartwood. In such a case, the state of the market for this class of timber should in a general way determine the period for cutting, and advantage should be taken of any temporary increase in the demand. Amongst species which are apt to deteriorate after a certain stage of growth are larch and ash. Larch may become affected by disease or heart-rot, while the timber of ash may become black or dark-coloured, and this decreases the value. In both these cases the actual growth of the trees must always be considered in relation to the contingencies mentioned, and no definite size or age can be given at which they can be most profitably cut. Cases of timber decreasing in value with an increase in size may be met with in beech or silver fir, or in timber which is intended for pit-wood. With these, very large timber is more difficult to handle and convert than timber of moderate size, while its converted value per cubic foot remains the same, and it rarely makes so high a price in the form of round timber when of large dimensions as when smaller.

<sup>\*</sup> For Nos. I. to VI. see the issue of the Journal for January, 1906. Vol. VI. No. 2.

Apart from the above considerations, the proper time for cutting

most kinds of timber is when it has reached,
Indications of but not exceeded, maturity. Other than
making actual measurements at stated intervals, which enable the rate of growth to

be ascertained, the maturity of most species is indicated by the external appearances which are well known to the practical man. The most prominent indications are, 1st, the small size of the needles or leaves; 2nd, the stunted appearance and diminished length of the annual shoots, and possibly the growth of moss or lichen upon them; and 3rd, the presence of dead branches or twigs in the upper part of the crowns. Trees exhibiting these features may usually be considered as fully mature, and should be felled at the first favorable opportunity.

As regards the commoner species of trees, when these are grown in ordinary plantations, and on average Age for Felling.

Soils and situations, the most profitable ages at which they may be cut are as fol-

lows:—Pine and spruce, 70-100 years; larch, 50-80; ash, 60-80; Spanish chestnut, 40-60; beech, elm, and sycamore, 80-100; tree willows and poplars, 40-50 years. Oak, grown on good land, is rarely mature until 120 years or so, as its value depends greatly upon the proportion of heart-wood the timber contains. With hedgerow timber it is very difficult to fix any age for profitable cutting, as the development of the trees is often uncertain. As a rule, however, only tall, well-shaped trees should be allowed to stand after sixty or seventy years, and for the sake of the hedges they should not be allowed to attain too large a size.

The usual methods employed by those having timber to dispose of are either to sell it privately or by

The Selling of auction as it stands, or to cut and lop it before offering for sale. In the case of small lots of timber standing at a distance

from a suitable market or railway, it is usually better for the seller to have some idea of the price he is likely to receive while it is still standing, as when once cut the timber must sooner or later be sold whatever the price may be.

With very small lots of less than about fifty trees, the expense incurred in selling by auction would probably be out of proportion to the extra price obtained, and in such cases private sales are usually more satisfactory. An arrangement as to price can either be made before the trees are cut, or the trees can stand until a better offer is forthcoming. With larger lots, or where the owners of several small lots combine for the purpose of selling, auction sales may be advantageous in districts where there is a prospect of a fair number of buyers attending, and where the timber is of sufficiently good quality to create competition. For such sales it is necessary to lot or number the trees with paint, so that they can be easily identified, and if more than one tree is placed in a lot, care should be taken that all are of the same species and as nearly alike in quality as possible. A definite date should be fixed for the removal of the timber, and all unnecessary damage to gates, fences, drains, or crops should be provided for by the usual conditions of sale.

Whatever method may be employed for selling timber, the owner should be able to judge its approximate value per cubic foot, as it is upon this that the sale of timber is based. As this value will vary in different localities, only general rules for valuing timber can be given. It may be stated generally that timber of any kind varies in value per cubic foot according to quality, proximity to a market or consuming centre, the conditions for removal, and the existing local demand.

Quality of timber depends upon soundness, the size of the individual tree (up to a certain point), and the straightness, freedom from knots, and length of the bole or part of the stem below the branches.

The distance from a market, and the position in which timber stands or lies affect the price considerably, as the cost of conveying it to the place in which it is sawn up is sometimes heavy, and, with low-priced timber, may equal or exceed its delivered value; consequently the timber becomes unsaleable. Rough and inferior trees growing in deep hollows, boggy ground, or on spots with long bad roads between them and the consuming centre are often difficult to dispose of, and low prices must be expected. Timber, on the other hand, of good quality, standing close to good firm roads, and within two or three miles of a local saw-mill, railway station, or canal, can usually be sold at fair prices, varying according to the species of trees offered. Larch, ash, and oak of good quality are the only species for which an outside demand exists in many districts, and for these a buyer at a distance may sometimes be found. But with other kinds of timber it is gener-

ally advisable to trust to buyers in the immediate neighbourhood, and their prices will mainly depend upon the condition of the local market. This can usually be ascertained in a general way by announcing the fact that a certain quantity of timber of such a species is for sale. The readiness with which this announcement is responded to will indicate the existing demand.

Making due allowance for the various factors mentioned above, the prices per cubic foot that may be expected in most districts in Ireland, for timber of good quality, are:—Larch, 6d. to 1s.; ash, 1s. to 2s.; sycamore, 9d. to 1s. 6d.; oak, 1s. to 2s.; pine and spruce, 3d. to 6d.; beech, 4d. to 8d.; elm, 4d. to 8d. Trees of exceptional quality, suitable for special purposes, or trees that are very favorably situated, may make more, while badly-situated timber may make less than these prices.

Gales which blow down large quantities of timber from time to time invariably lower prices in any district. While they cannot be prevented, Blown Timber. their effect may be diminished to some extent by suspending all sales of standing timber until prices have again reached their normal level. The blown timber should also be sold off as gradually as possible, provided this can be done without inconvenience from the position of the fallen trees. allowed to remain as it falls, blown timber does not deteriorate so long as sufficient roots remain in the ground to keep up a supply of sap to the crowns. But when the tops are removed, and the trees cut off at the butt, species with no true heart-wood, such as beech, ash, sycamore, spruce, &c., quickly lose their value, and these should be sold off with as little delay as possible. Oak, Spanish chestnut, elm, larch, &c., do not suffer by lying on the ground for two or three years, if that be necessary, although much will depend upon their age, and the condition of the ground on which they are lying. Old, well-matured timber lying on dry ground will remain fresh longer than young sappy trees on wet water-logged land. As a general rule, however, all timber should be cleared away within three years of its fall.

Copies of this article in leaflet form (No. 72) may be obtained free of charge, and post free, on application to the Secretary, Department of Agriculture and Technical Instruction for Ireland, Upper Merrion-street, Dublin. Letters of application so addressed need not be stamped.

# THE PLANTING AND MANAGEMENT OF HEDGES.

The importance of good hedges on agricultural land of any kind is so obvious to owners and occupiers that it is unnecessary to give reasons for advocating that proper attention be paid to them. At the outset, the cost of planting and raising a thorn hedge is comparatively heavy, and in excess of that incurred in erecting a post and wire fence. But when once established, a thorn hedge, if properly managed, is practically imperishable, while its value for shelter to live stock against wind is well known. It may be true that many hedges fail to serve as fences, are of little or no value as shelter, and are rather an eyesore than an improvement on a farm. When, however, this state of things has been brought about by a long course of neglect, or a system of management even worse than neglect, such examples do not provide a sufficient reason for condemning hedges generally or for regarding them as useless features on a farm.

To obtain the greatest benefits from the planting of hedges, it is necessary to bear several points in mind. First, the site for a hedge should be only on Position of Hedges. a boundary line, road side, or main divisional line of a farm, or wherever a permanent fence is required. The trouble and expense of raising a hedge make it imperative that its functions should be performed over a long period, otherwise no adequate return can be made for the original outlay. Hedges, therefore, are not adapted for the sub-division of fields, or for enclosing small areas of land, unless in the cases of orchards or gardens, as they take up much more ground than a dead fence and are wasteful when in excess. In the second place, a hedge should always be planted on fairly good ground, as otherwise it will not retain its vigour for any length of time. Strong loams or clayey soils, or those of a fairly deep and porous nature, will usually grow good hedges at any moderate elevation, but on poor gravels or very thin soils, sheltered situations are necessary to produce satisfactory hedges. Other points of importance are the careful choice of a species of hedge plant to suit the soil and situation, and the careful preparation of the soil before planting.

Upon the latter operation will depend the speedy development of the plants into a short hedge, and several years are gained by properly attending to this work.

Species suitable for forming hedges intended to keep back live stock are comparatively few in number, unless the hedge is placed on a bank. On Species for Hedges. level ground a hedge must be formed of stiff growing plants, such as whitethorn or blackthorn, otherwise heavy cattle break through them sooner or later. With a low bank, however, many other species may be found which answer the purpose fairly well, according to the nature of the soil. good strong soils of any kind the whitethorn is undoubtedly the best for all round purposes. Blackthorn and hornbeam do well on very stiff clay, with proper drainage. On light, dry soils, beech and myrobella plum are probably the best, the latter making a very rapid growth. On bog land probably birch makes the most satisfactory hedge if properly managed, while several species of willow can also be used in such places. Where shelter is wanted, a certain proportion of beech or hornbeam may be used with any of the deciduous species, as the former retain their leaves through the winter, and more effectually break the wind. Strong, wellrooted plants, from 11 to 2 feet high, are usually the best size for use when planting hedges; larger plants are slower in becoming established.

When hedges are planted on the flat, the ground should be trenched to a depth of 2 feet, and to a Method of Planting. width of about 3 feet. If the soil is of a poor nature, such materials as edgings, well-rotted farmyard manure, leaf-mould, or a proper dressing of artificial manure, should be worked in, and the ground levelled as much as possible by filling up hollows and lowering high This work should be done in the autumn, and the ground left to settle down until the following spring. Planting should then be carried out as follows: -- A trench with straight or perpendicular sides should be made along the centre of the prepared ground, a line being used to keep it perfectly straight, or in a regular curve, according to the direction in which the hedge is to run. This trench should be about 9 inches deep and 12 inches wide, and the soil taken out of it should be placed on one side so

that it can be taken up easily on a spade. The plants should then be placed in two rows, one against each side of the trench, with an interval of 9 inches from plant to plant, and arranged so that each plant in one row stands midway between two plants in the opposite row.

In planting, two men, or one man and a boy, are required. One of these places the plant in position as he moves backwards along the trench, while the other fills in the soil taken out of the trench, so that the plants are kept in position until they can be firmly trodden in later on. Planted at the distance mentioned, eight plants are required to the yard.

Probably a better method than planting on the flat is that of throwing up a low bank or ridge about two feet above the general level of the ground. This bank should be about three feet wide at the top, and the sides should be faced with turf to prevent crumbling. The hedge being slightly above the ground level, it receives more light at the base, and is not so easily overgrown with weeds and rubbish as when on the flat, while cattle or horses cannot push directly against it. When a bank higher than two feet is made, there is a great danger of horned cattle breaking it down with their horns, or rabbits burrowing into and undermining it, while the roots of the hedge are confined to the bank itself, the soil of which in time becomes dry and exhausted.

In both the above methods of hedge-planting a temporary fence upon one or both sides will be required for several years after the hedge has been planted, and the hedge must also be protected against rabbits. To avoid the necessity for this fencing, the custom prevails in many parts of Ireland of building up a high turf bank and planting the hedge on its face. This forms a readymade fence at once, and as the hedge develops it prevents the bank from being pulled down after the turves have decayed, while the roots of the hedge also assist in holding it together. So long as the bank remains intact this form of hedge answers the purpose fairly well, but it often gets into an unsatisfactory state in the long run, and it is difficult to repair. Where stones have been freely used in its construction it is, however, of a more durable character.

458

For three or four years after planting, hedges require little
beyond keeping clean from weeds at the
Management. bottom. At the end of that time they
should have become thoroughly established,

and their branches should fill up all gaps between the plants. For the purpose of forming a thick, close bottom, however, it is usual to cut off the thorns, plums, &c., close to the ground, so that each plant may throw out a number of strong, straight shoots, which form the backbone of the hedge later on. This cutting should be done with a sharp knife, but should not be extended to beech or hornbeam, as these should not be touched until they have reached the height desired. The mistake is often made, however, of cutting hedge plants at the time they are planted, or the year following. The plants are not then in a position to throw out strong shoots, and when cutting is done at that time the hedge remains weak for several years. At least three years should elapse between the planting of the hedge and cutting it over, and the resulting growth will then form a stiff erect hedge which will serve as a fence in the second season and can then be cut at once into shape.

The efficiency of hedges depends a great deal upon the shape to which they are kept trimmed. The only satisfactory form in which a hedge can be maintained is that of a wedge or triangle, the base of which rests on the ground, and coming to a point about four feet up. Given such a shape, all parts of the hedge receive an equal share of light, and the part near the ground is kept thick and close. When kept round or square at the top the bottom invariably becomes weak and thin, and gaps are easily made in it.

The cutting or trimming of hedges should be done with a sharp hedge-knife, and the cut should always be made in an upward direction, so as not to tear or bruise the shoots of the hedge. On an ordinary form, cutting once in two or three years is often enough, provided the hedges are cut hard in, and not allowed to get larger and wider at each cutting. Gaps and weak places should be attended to at each cutting, and strengthened by putting in a post and rail, or by bending the plants on either side into the gap. Dead thorns or rubbish of any kind should never be used to fill up a gap, or the latter will probably become permanent

by the weakening and death of the plants on which the rubbish is laid.

Every effort should be made to prevent horses or cattle eating the young shoots of a hedge in the months of May and June following the time of cutting, as this tends to weaken its growth considerably for the rest of the season, and if constantly repeated may injure it permanently.

Copies of this article in leaflet form (No. 73) may be obtained free of charge, and post free, on application to the Secretary, Department of Agriculture and Technical Instruction for Ireland, Upper Merrion-street, Dublin. Letters of application so addressed need not be stamped.

# A DISEASE OF YOUNG CATTLE IN COUNTY WEXFORD.\*

#### A PRELIMINARY REPORT.

By Professor A. E. Mettam, Principal of the Royal Veterinary College of Ireland.

For some years past the farmers of the county of Wexford and other districts of Ireland have lost numbers of young stock from an unrecognised disease which is manifested by wasting, chronic persistent diarrhea, extreme weakness and prostration, eventually terminating in death.

The Department undertook to elucidate the cause of the disease, and after a considerable amount of work it was shown that in the fæces of the calves eggs of certain nematode worms were constantly to be found, and that after death there were discovered in the abomasum or true stomach of the sick animal nematode worms, strongyles, in variable numbers. The cause of death was attributed to the presence of these animal parasites, and experiments were next instituted to obtain a possible remedy against the parasites. It was with the object of obtaining such a remedy that a number of cattle suffering from the disease were sent into the Royal Veterinary College of Ireland for observation and experiment.

In this report I propose to give an outline of the symptoms observed, the *post-mortem* examinations made, the history of the different animals while in our care, the treatment undertaken, and the results.

The invasion of the disease is comparatively slow and insidious.

We have never had an opportunity of observing naturally-infected cases from the onset of symptoms, but Mr. Norris has had

much experience of the disease in the field, and it is to Mr. Norris that we owe the cases which came to us for experiment.

The calves we received were in more or less advanced stages of the disease, and had been under observation and treatment of

<sup>\*</sup> See issue of the Journal for October, 1904, Vol. V., No. 1, p. 48,

some kind for periods varying from four to ten weeks previous to their reception in the College. There is considerable difficulty in obtaining cases in the early stages of disease; the owners refuse to sell until the animals are practically moribund, hence the investigation has been much hampered by lack of suitable material.

The predominating symptoms are progressive wasting and anæmia, with intermittent diarrhea which defies the ordinary remedies. The fæces may be exceedingly watery for several days or weeks at a time, and ejected with great force and straining, and then for a time the dung becomes normal in appearance; there may even be costiveness for a period, to be followed, however, by another attack of diarrhea. Occasionally the dung is blood-stained, either red in colour or black (melena), owing to changes in the blood-colouring matter present. Sometimes the odour of the discharges from the bowel is very offensive. The urine is normal in appearance, occasionally is contains albumen.

The appetite is very capricious: in some cases the patients will eat fairly well even when exhaustion has progressed to such an extent that they are unable to stand, while in other cases the calves absolutely refuse to take any food for quite a week previous to death, being sustained during that period in cases under our observation by drenching with linseed gruels and treacle.

The pulse is usually soft and about normal in frequency. The respirations are very little disturbed except in the later stages, while the temperature per rectum oscillates somewhat (100°—103° F.), the average being slightly below normal for calves of this age (six to twelve months). The external temperature is distinctly lower than in health, and the extremities are frequently quite cold. The mucous membranes are paler than normal, frequently slightly yellow in advanced cases. The other symptoms are mainly those associated with the anamia—pendulous abdomen, hollow flanks, and sometimes dropsical swelling of the intermaxillary space. Death is usually preceded by great debility and prostration, the patient lying stretched out for the last twenty-four hours or so of life.

The fæces of the calves were examined daily microscopically for nearly two months, special attention being devoted to the detection of animal parasites or their ova. Eggs were generally to be found, the two commonest being those, probably, of the nematode worm, a minute thread worm of the stomach, the strongylus gracilis, and the common liver fluke distomum hepaticum. The numbers of

eggs found, however, bore no relation to the severity of the attack of the disease. It frequently happened that the eggs were most numerous and most easily discovered in those calves apparently recovering and commencing to thrive, while the search was often long and tedious before a single egg could be found in some of the worst cases with pronounced diarrhæa. Only on two occasions were adult strongyles found in the fæces. (As to presence of eggs and strongyles in apparently healthy animals, see below.)

One other point of note is the fact that the calves on their arrival were all to a greater or lesser degree infested with lice, *Trichodectes scalaris*.

Since a somewhat similar disease of young stock (but with blood in the fæces, and hence called red diarrhea) has been observed in France and Switzerland the cause of which is a coccidium, particular examination for the presence of such a parasite both during life (examination of fæces and scrapings from the rectum as high as could be reached) and after death, was made, but with negative results.

The animals were all extremely emaciated, the skin hidebound and soiled with manure which had dried Post-mortem and become adherent. There was often an escape of liquid fæces from the anus when Examination. the subject was placed upon the post-All the fat from the body had practically dismortem table. appeared. On opening the abdomen a variable quantity of fluid was found, even up to about twenty ounces, but there never was pronounced ascites. The mesenteric lymphatic glands, as usual in the calf, were large and juicy. The mesentery in some instances was much thickened by infiltration of lymph. The hæmo-lymph glands were very prominent. The spleen firm and slightly smaller than normal. The liver was large and cirrhotic, often showing the presence of flukes. The gall bladder enormously distended, filled to repletion with a thick grumous bile. The bile duct was patent and the bile could be easily expressed into the duodenum. The increase in size of the gall bladder and the excessive amount of bile present was an almost invariable and very striking post-mortem characteristic. The stomachs were generally normal, the abomasum or fourth or true digestive stomach sometimes was congested, and scrapings from the mucous membrane on microscopic examination revealed a number of strongyles. In the cases seen in the College the number of worms was never

very great. Loss of epithelium, catarrh of the mucous membrane, and sometimes excoriation, may be observed, but in the College cases such were quite insignificant. In one case the stomach and intestines showed a gastro-enteritis extending from the abomasum throughout the intestines to the rectum. The lesions observed were petechiæ in the ileum, longitudinal hæmorrhagic markings in the colon, and in addition numerous pustules. In the majority of cases, however, there were no lesions in the intestines, but a few parasites (strongyles) were occasionally found in the duodenum. The kidneys were to the naked eye healthy, the fat surrounding the organs had disappeared. The urinary bladder and contents were apparently normal.

Generally the lungs were normal save for some emphysema, or a little ædema, sometimes a patch of collapse, or for the presence of the *strongylus micrurus* (the cause of hoose or husk). In one case (15) there was a slight broncho-pneumonia.

There was no evidence of pleurisy, save in No. 2; but here the lesion was quite trivial and longstanding. The pericardium may contain fluid, but this is not uncommon in other animals dying from chronic wasting diseases. Subepicardial and subendocardial hæmorrhages (petechiæ) may be present. In one case killed in extremis on 15th June the heart muscle was extensively invaded with sarcosporidia (sarcocystis tenella v. bovis).

The yellow marrow may have disappeared from the cavities of the long bones and its place be taken by a red marrow well described by pathologists as like to red currant jelly—a condition observed in profound cases of anæmia.

Examination of the blood revealed a fall in the number of red corpuscles, but not very marked. There was no great change to be observed in the character of the red blood cells, though occasionally corpuscles slightly larger or smaller than normal were seen. In the human subject suffering from the presence of a strongyle in the duodenum (Ankylostoma duodenalis—Ankylostomiasis) there is well marked eosinophilia, that is an increase, in some cases relatively enormous, of the so-called eosinophilous corpuscles (a variety of white blood corpuscles) but in the calves there was no eosinophilia at any time noticed.

The disease from which the calves were suffering and which gave rise to the very serious mortality, was believed to be due to the presence of the nematode worms in the abomasum or true stomach, and the experiments carried out in the College had for their aim the discovery of a ready and effectual remedial agent. Various preparations were tried, such as thymol—a specific in ankylostomiasis of man, coal-tar creosote used in several American experiments, carbolic acid, tobacco vaunted as a specific for the disease, turpentine, oil of tar, lysol recommended for a similar condition in sheep, arsenic, subcutaneous injections of carbolic acid and of perchloride of mercury solutions, as well as tonics of several kinds, both vegetable and mineral. Chrysoidin, an aniline preparation, recommended for the treatment of man suffering from parasites in the blood stream, was also obtained and used.

During treatment a daily and exhaustive examination of the fæces of every calf was made for the discovery of eggs and parasites, with the object of noting any increase or diminution of the numbers voided. As before mentioned the number of eggs were very variable, not only when comparing the results obtained from different calves but also in the same calf from day to day; and contrary to expectation, when the diarrheea became most marked the numbers of eggs found frequently fell, so that considerable difficulty was experienced in discovering any at all.

Examination of the fæces was carried out as follows: -a quantity of dung was obtained from the rectum and placed in a watch glass which bore a number corresponding to the calf and so conveyed to the laboratory. A small quantity of this material was then placed upon a microscopic slide and a few drops of water added, and a smear then made over the whole slide. The whole surface was then methodically examined and the results noted. If no eggs were found a second and a third lot from the same animal was examined and the results noted. The work was carefully done, and I desire to express my obligations to Prof. Wooldridge and his class of senior students for the care and the enthusiasm they gave to this portion of the work, which was not always pleasant. From time to time I controlled the results obtained. Later I adopted another method. A portion of fæces was taken and shaken up with water in a sedimentation glass and the whole allowed to settle, the eggs being heavier than water fall with other debris to the bottom and may then be pipetted and placed upon a slide for examination. Practically, this method has no advantage over the fermer.

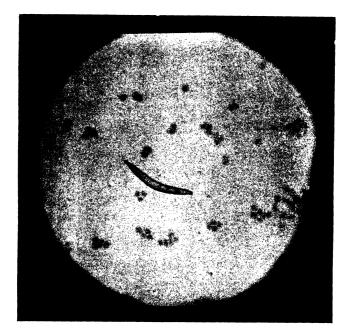
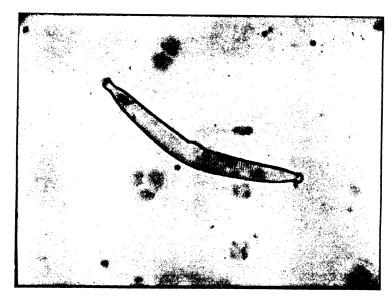


Fig. 1 -Filaria in Blcod of Calf 2. The blood corpuscles are indistinctly shown. (Microphotograph).



.Fig. 2—The Filaria more highly magnified (Microphotograph, ol. Immers. 12, Ocnt. 2, Camera 50 cm.)

#### RECORD OF CASES.

Calf 1.—White heifer, symptoms of the disease for about six weeks; eleven months old. Losing condition; has intermittent diarrhœa; fæces examined daily from February 15th, but no eggs found until February 22nd. She received—arsenic, 4 grains; tartar emetic, 1 dram; sulphate of iron, 2 drams in mucilage daily from February 23rd to March 2nd, missing on February 26th, when a tonic powder was given. The appetite remained fair; the fæces on March 2nd became diarrhœic, when the dose of arsenic, &c., was stopped and catechu given. The scour became intermittent, but after some time the fæces became of normal consistence. animal did not thrive for some weeks, and occasionally bloodstained mucus was present on the fæces which were normal otherwise in appearance. Later she began to improve in condition, to put on flesh, and eventually became the best of the survivors. She died from black quarter in October practically fat, though during the last three months of her life she only received hay.

Calf 2.—Red and white bullock, over a year old. Ill two months, wasting, intermittent scour. Had received the tobacco treatment, receiving \( \frac{1}{2} \) oz. daily in bolus. Eggs of parasite present in fæces and found every day examined. The animal received-carbolic acid 1 dram, turpentine 1 oz., in 10 oz. of linseed mucilage, daily for a week by means of the stomach pump. The appetite was fair, the fæces remained normal until the beginning of March. Diarrhea then set in, but was controlled by catechu. After stopping the carbolic acid, &c., tonics were given. The animal made moderate improvement for a time. He was kept at the College for observation for twelve months, and his blood was examined on many occasions, sometimes for many successive days. occasion, Feb. 19th, 1906, a filaria was observed in a film made from the peripheral blood, an illustration of which is appended. The observations made of the blood from this subject and others will be included in a separate report. Though he continued in apparently good health, feeding well, indeed, taking all that was given him, and his fæces remaining to all appearance normal, still he did not grow and was practically the same size when killed as when he arrived at the College. I give in extenso the result of the post-mortem of this subject, which was made on March 8th. 1906.

The animal was not in good condition; fat was practically absent from the body. On opening the abdominal cavity a small quantity of fluid was found. There was no peritonitis. The spleen was small and firm. The liver cirrhotic, The kidneys, urinary infested with flukes, small and hard. bladder and contents were normal. The mesenteric lymphatic glands and visceral peritoneum generally normal. fourth stomach or abomasum showed upon the mucous membrane peculiar circular areas slightly depressed and paler than the immediately surrounding mucous membrane, in size about that of a vaccination mark and smaller. The mucous membrane covering them was smooth. The lesions were upon the lateral surfaces of the folds of the mucous membrane in the fundus They were not present upon the mucous memthe stomach. brane towards the pylorus-towards the opening of the stomach into the intestine. The marks are doubtless due to the presence of parasites in the stomach. Scrapings from the mucous membrane revealed a few strongyles-not S. gracilis, and a few eggs. A careful examination, both naked eye and microscopic, was made of the whole length of the intestine, but nothing abnormal was noticed. As the animal in the previous spring had several times had blood in its fæces (melena) a particularly searching examination of the large intestine was made, but with negative results.

There was evidence of a slight pleurisy of a long prior date, The lungs showed quite a large number of minute petechiæ (blood fleckings). A slight amount of fluid in the pericardium of no consequence. The heart was normal. No sarcosporidia were found in films examined.

The yellow bone marrow—a humerus and a femur were examined, was normal, firm and hard. The red marrow appeared to be diminished in amount. The other parts examined were found to be normal.

I consider from the *post-mortem* evidence that the animal had had parasitic gastritis from which it had recovered, and that its lack of development and unthriftiness may be explained by the condition of the liver, which was small and in an advanced stage of cirrhosis.

Calf 3.—Red and white heifer. Ill about a month. Eggs found on February 16th, 1905, and on the 20th of same month; afterwards a few eggs were found at intervals

but with difficulty. She received daily for eleven days  $\frac{1}{2}$  oz. of oil of tar given in mucilage. The fæces were at first watery, afterwards they improved, but later on again became diarrhæic. During March the fæces became almost normal. When scouring the subject received catechu and tonics, the latter being continued for some time after the catechu had been stopped. The appetite was capricious. The condition of the animal improved and the scour ceased. She was kept under observation for some time and then returned to Mr. Norris.

Calf 4.—White and red heifer. Ill for ten weeks. Tongue affected (calf diphtheria?). Catarrh from nose. Coughing. Unthrifty appearance. Moderate scour. Eggs found daily in the fæces. Fæces normal for five days after arrival, then became liquid for a period of three days, then normal again for five days until death. Appetite fairly good, moderate on February 23rd, feeding to February 26th, weak, could not rise; collapse and death on February 27th. Received lysol 2 drams on the first day of treatment, and 1 dram daily afterwards for six days in half-a-pint of water by the stomach pump. Tonics were given daily until death after the lysol had been stopped.

On post-mortem examination a few strongyles were found in, the abomasum. The gall bladder was full and distended.

Calf 5.—Red and white heifer; yearling. Ill five weeks. Ringworm about the head. Intermittent scour. Is covered with lice and very weak on arrival. Fæces thin and watery every day until death. Appetite none, save on February 19th, when she picked a little hay and cake. Drenched daily with flax-seed gruel. Eggs found in fæces on February 16th for first time, and with difficulty daily afterwards. Received thymol 2 drams on Feb. 17th, and one dram daily up to the 22nd. The thymol was dissolved in spirit and given in gruel by drenching. On February 23rd she received a stimulant, but died during the night of 23rd and 24th. Post-mortem examination revealed an enormous gall bladder filled to repletion with bile. Flukes were present in the liver, which was cirrhotic. Few strongyles in the abomasum; the omasum or third stomach was almost empty.

Calf 6.—Red heifer. Ill about a month. Fæces thin and watery, of a greenish-black colour to the 20th. Blood in fæces (melena) from Feb. 17th to death on night of 23rd-24th February.

Eggs found daily in the fæces save on February 16th, when none could be discovered. Treatment consisted of—creosote 1 dram in linseed mucilage, given as drench daily on February 20th, 21st, 22nd and 23rd. Tonic and catechu also given on the 23rd. When the animal was down, collapsed, subcutaneous injections of ether were given. Took nothing voluntarily save on February 19th; was daily drenched with linseed mucilage.

Post-mortem examination.—Large gall bladder. A few strongyles found in the abomasum. The omasum was practically empty. No lesion could be found to account for the blood-stained fæces.

Calf 7.—Companion of No. 2. Red bullock. Had received 1 dram doses of creosote daily for ten days, and also aloes and salts before he came. This animal served as a control and did not receive any parasiticide whilst in the College. Tonics were given for a week when off his food. Eggs found most days, but were not numerous. On March 15th living strongyles in copula were discovered in the fæces, one of the only two occasions on which adult parasites were found in the fæces. Fluke eggs found in the fæces of this animal as well as in the dung of other calves. He was evidently infected with fluke, as his companion, No. 2, proved to be on post-morten examination. The fæces were somewhat variable but most often of normal consistence. Appetite fair. This animal grew fairly well, but did not thrive as he should have done, taking into account the feeding he got; 3 to 4 lbs. of crushed linseed cake, 1 lb. of treacle, pulped turnips and hay formed the daily ration. If the cake was not taken it was made into a gruel and given as a drench.

This animal, after being under observation for some months, was returned to Mr. Norris.

Calf 8.—Companion of Calf No. 1. Red bullock. Only lived three days after arrival and was killed in extremis. He received —hyposulphite of soda 4 oz., common salt 2 oz., on February 16th and 17th in a pint of water. The animal had no appetite; the fæces were thin and watery. Eggs were found on the 16th and 17th, but none could be discovered on the 15th. The animal had a cough; there was a catarrhal discharge from eyes and nose. On post-mortem examination strongyles were found in abomasum and duodenum. Liver showed biliary congestion. The gall bladder was enormous and contained 23 oz. of bile (measured).



Fig. 3—Liver of Calf showing the enormously enlarged and distended gall bladder.



Mesentery quite three-fourths of an inch thick and infiltrated with lymph. No gastritis, but catarrh in patches. Strongylus micrurus and eggs of same in the bronchial tubes (hoose).

Calf 9.—Red and white heifer, came from an infected farm—that is a farm upon which animals had died from Its comrade had died during the present season with typical symptoms. On arival at the College scour absent. Eggs were found daily in the fæces save on the first day of examination. Treatment consisted in two drams of tobacco given in bolus daily for eight days. (Tobacco was employed because it has been claimed for it that it is a specific.) Tonics were given for four days following. Afterwards, when scouring became pronounced catechu was given in lieu of tonics until death on March 4th. The animal fed moderately well until February 27th, after which it refused all food. were thin and watery on February 16th, normal until the 21st, when they again became liquid until death. There was practically no scour until after the administration of the tobacco, but this may be a mere coincidence.

Post-mortem examination revealed the condition common to all examined after death, viz., biliary congestion of the liver, distended gall bladder, a few flukes in the liver. There were also found a few strongyles in the abomasum and intestine.

No. 10.—Roan bullock.—Ill about a month. Eggs found on February 17th onwards. No eggs could be discovered on the first two occasions upon which the fæces were examined. This patient was given chrysoidin in 1 dram doses daily by the stomach pump for seven days. The chrysoidin was dissolved in warm water, forming an intensely yellow fluid. Its use has been suggested for the treatment of man suffering from blood parasites. The appetite in this case was never very good, moderate and capricious at the best. Fæces at first watery, then normal for a week, followed by diarrheea for a week; again normal for a period, followed by From February 24th to February 28th tonics were diarrhœa. administered, and from February 28th to March 6th catechu and tonics. It also was given a second course of chrysoidin for nine days, beginning on March 8th, omitting March 12th, when a tonic was administered. Tonics and catechu were again given until March 27th, when the animal was very weak. On this day he received a stimulant. Death occurred during the following night. On March 15th the patient was very weak, but rallied until March 26th, when he collapsed and was unable to rise, and refused all food. Up to this time he had fed moderately well.

Post-mortem examination revealed fluid in the peritoneum, a cirrhotic liver with flukes. The gall bladder was enormous. Abomasum was found congested. A few strongyles were present, but insufficient to account for the condition of the mucous membrane of the stomach (chrysoidin poisoning?).

The lungs showed areas of collapse and some emphysema. Slight amount of fluid in pericardial sac with ecchymoses below the epicardium. The use of the chrysoidin was somewhat of the nature of an experiment, because hitherto so far as I know, it has not been used for the lower animals, and it may be that the animal received too large doses of the preparation. The animal died, however, ten days after the last dose of the drug had been given.

No. 11.—Roan heifer from same farm as Nos. 1 and 8. found on February 15th, 16th and 21st after prolonged search. Received as treatment in bolus 1 oz. of Venice turpentine and 1 dram of Beta naphthol daily for six days. The animal was always in a weak condition and died during the night of February The appetite was fair for the first four days; it refused all food the day before death. The fæces were normal up to and including February 19th, when diarrheea set in. The condition of the fæces improved and became of medium consistency up to death. Post-mortem examination showed the animal to be in fair condition. There was faint bile-staining. There was an enlarged gall bladder, as in Calf 8, and biliary congestion of the liver. The omasum (manyplies or third stomach) was packed with food. Abomasum contained parasites (s. gracilis) and eggs. The thoracic contents were normal.

The above eleven calves formed the first batch of animals received; a second lot was sent in and systematic examination and treatment began on March 22nd, 1905.

No. 12.—Red and white heifer. Eggs found in the fæces daily until March 25th. The animal died during the night of the 25th and 26th. The animal on arrival was scouring and blood was present in the fæces. Catechu was given to arrest the diarrhæa. The animal fed moderately well.

Post-mortem examination on the morning following death showed gastro-enteritis. The whole length of intestine, with

exception of the rectum, was involved. In the ileum small red spots (petechiæ) were found; in the colon there were pustules, ulcers and longitudinal blood markings in the mucous membrane. The liver was cirrhotic with distended gall bladder. Parasitic nematode worms were found (s. gracilis) in abomasum and duodenum. From 15 to 20 ounces of fluid found in the peritoneum. The lungs were emphysematous, and in the bronchial tubes a few strongyles (strongylus micrurus), the cause of hoose, were present.

No. 13.—Red bullock. Eggs found in the fæces up to March 29th, when the search for eggs generally was abandoned. The animal on the whole fed well, exceptionally during the first few weeks. The appetite on certain days was not good. Up to March 30th the dung remained normal, then it became watery, and remained so for a few days afterwards, becoming normal and remaining so until the animal was discharged from the College.

This subject got tonics for several days; on five days beginning March 27th he received  $\frac{1}{2}$  dram doses of thymol dissolved in spirit and given in linseed mucilage. On April 2nd he got a dose of thymol and catechu. During the remainder of the time the bullock was under observation his health continued good, but he only grew slightly and did not develop satisfactorily.

No. 14.—Roan bullock. This animal was a typically bad case, and had persistent scour every day from admission until death on April 9th-10th. The faces towards the end of life had an offensive odour. Eggs of parasites were found in the faces when looked for. The appetite was capricious up to April 1st; afterwards he refused all food for five days, during which period he was very weak and could scarcely stand unsupported. On April 7th and 8th he took a little food, but collapsed on April 9th, and died during the night. He received catechu daily from March 21st to April 2nd, and in addition, on March 27th he got 1 dram of Beta naphthol and ½ dram doses of the same drug on the 28th, 29th, 30th and 31st of March, and on April 2nd. On April 3rd he received hypodermic injections of perchloride of mercury, 20 c.c. of 1 in 1,000 solution, and a similar dose on April 6th.

Post-mortem Examination.—There was rapid decomposition, the carcase was very offensive. The gall bladder was enlarged. Strongyles were found in abomasum and duodenum.

No. 15.—White heifer. Appetite whilst under observation very capricious; refused all food from March 28th, and died on night of March 31st. Fæces were watery every day save on March 25th, when they were firmer in consistence. Eggs were found daily in the fæces. Catechu was given daily to check the diarrhea, and from March 27th 1 dram of creosote in addition. From March 27th onwards the calf was very weak, lying persistently.

Post-mortem examination revealed a large gall bladder and biliary congestion of the liver. There were a few liver flukes present. The urinary bladder was very full owing to the continuous lying down. The lungs showed lesions of broncho-pneumonia.

No. 16.—Red heifer. The animal had diarrhea from time of admission until April 4th, and then the intestinal evacuations gradually improved to normal. There was a relapse on April 17th, and the condition of the bowels varied until May 11th, when the diarrhea became pronounced and continued without interruption until the animal was killed on June 15th. were found daily during examination of the fæces, and on March 27th a live strongyle was found in the dung. The appetite was capricious, but generally was fairly good until the last few weeks of life, when it could only be accounted moderate. temperature in this case, as in others, remained practically normal throughout; on the day of death it was 101.5° F. On May 15th a microscopic examination of the fæces was made when eggs were found, not only in the fæces of this animal, but also in the fæces of Nos. 1, 2, 3, 7, 18, 19 and 20. (Calves 18, 19 and 20 were experimental calves purchased in Dublin and were in the best of health apparently.) Catechu was given from March 21st onward for a fortnight. On March 27th and following five days the subject received two drams of lysol and spirits of chloroform in half a pint of water by the stomach pump. A tonic was given on April 7th. After this date she received at intervals of a week hypodermic injections of 20 grains of quinine. The animal was very weak on April 21st, and blood was found in the fæces on April 30th. The calf was killed in extremis on June 15th. had become very weak and was unable to rise. It was in poor con-The diarrhea had become chronic and excessive, liquid fæces spurting from the anus when the animal was placed upon the post-mortem table.

Post-mortem Examination .- The mesenteric lymphatic glands were large and juicy, the hæmolymph glands prominent, and on microscopic examination found to contain blood pigment. The fat had disappeared throughout the body. The liver contained flukes, and was cirrhotic. The liver cells were fatty throughout the lobule. In appearance the kidneys were normal, but on microscopic examination the epithelial cells lining the convoluted lobules had almost entirely disappeared save for granules of chromatin and mere shadows of cells. (Pieces of tissues were fixed in sat. sol. of corrosive sublimate in spirit for histological examination and were taken from the body immediately after death. They were perfectly fresh, and the tissues were beautifully fixed, so the changes cannot be considered as due to imperfect fixing, as other parts of the kidney and other tissues do not show any postmortem change. The tissues were passed through paraffin in the usual way and cut on the Cambridge microtome). The spleen was firm and normal. Stomachs were normal. The intestine appeared to be little changed, but on microscopic examination the mucous membrane was found to have undergone a superficial necrosis (small intestine). The large intestine was in a condition of catarrh. A few strongyles were found in the duodenum. lungs were normal save for slight emphysema. The heart-muscle contained large numbers of the sarcosporidium-sarcocystis tenella v. bovis as revealed in smears made from the muscle. marrow of the long bones was replaced by a red substance like to red currant jelly. Examination of the contents of the intestine showed eggs of strongyles and flukes.

Calf 17.—Roan heifer. This calf was in a state of collapse on arrival and was never able to stand during its life in the College. It did not eat; the fæces were thin and watery. Eggs were found on March 22nd and 23rd. The animal died on March 24th. Did not receive any parasiticide, only intestinal astringents and stimulants.

Post-mortem Examination.—Liver was cirrhotic, with a large gall bladder. There was slight congestion of the fourth stomach (abomasum) and a few strongyles were present. Lungs were emphysematous, with here and there patches of collapse. Specimens of the strongylus micrurus were found in the bronchi.

The following table will give at a glance the results obtained from the drugs employed, and also the most striking losion found on *post-mortem* examination of those animals that died.

Calf.	Treatment.	Result.	Nematodes.	Condition of Liver. &c.
No. 1, .	Arsenic, &c., Carbolic acid,	Recovered, Recovered, but	Few eggs Eggs in fæces	Cirrhotic, with
, 3,	turpentine.	did not thrive.		flukes. Filaria in blood.
	Oil of tar, .	Recovered,	Few eggs,	_
., 4, .	Lysol,	Died,	Few strongyles at pest-mortem; eggs in dung.	Gall bladder dis- tended.
,, 5, .	Thymol,	Died,	Few eggs,	Liver cirrhotic. Large gall bladder.
,, 6, .	Creosote,	Died,	Few eggs in frees, and strongyles at post-mortem exa- mination.	Large gall bladder.
,, 7, .	None,	Recovered, .	Strongyles and eggs in fæces.	
<b>,, 8,</b> .	Hyposulphite of soda, &c.	Died,	Few eggs in faces: strongyles at post- mortem examina- tion.	Enormous gall bladder. Biliary congestion.
,, 9, .	Tobacco,	Died	Eggs in faces; strongyles at post- mortem examina- tion.	Large gall bladder. Biliary congestion.
., 10, .	Chrysoidin, .	Died,	Few eggs in faces: few strongyles at post-mortem examination.	Cirrhotic liver. Enormous gall bladder.
"11, .	Venice turpen- tine, Beta naphthol	Died,	Few eggs in fæces; nematodes at post-mortem exu- mination.	Biliary congestion of liver. Large gall bladder.
" 12, .	None,	Died,	Eggs in faces; strongyles at post-mortem exa- mination.	Liver cirrhotic. Large gall bladder.
,, 13, .	Thymol,	Recovered, but did not thrive.	Eggs found in fæces.	-
" 1 <b>4</b> , .	Beta naphthol. Injections of $1^{\circ}/_{00}$ Hg.Cl. <sub>2</sub> in H <sub>2</sub> 0.	Died,	Eggs found in imees: strongyles at post-mortem examination.	Gall bladder en- larged.
,, 15, .	Creosote,	Died,	Eggs in faces, .	Biliary congestion. Large gall bladder.
<b>" 16,</b> .	Lysol and chlo- roform.	Killed when dying.	Eggs and live strongyles in fæces.	Liver cirrhotic. Flukes.
,, 17, .	None, , .	Died,	Eggs in fæces; strongyles at post- mortem examina- tion.	Liver cirrhotic. Large gall bladder.

It will have been observed that all the animals harboured strongyles in the alimentary tract as an examination of fæces or of the contents of the stomach revealed, but the question to be decided is, can the strongyles account for all the symptoms and the appearances found at the post-mortem examination? To this question a definite reply cannot be given at the present time. In addition to the strongyles there were also present in a number of cases trematode worms-flukes in the liver, and to these parasites we are inclined to assign the continued unthriftiness of those animals that apparently recovered from the cause producing the acute symptoms. In those animals that remained alive after their companions had long been dead there was never any difficulty in finding the ova of strongyles. It is scarcely likely that the disease would have become arrested whilst the cause persisted. Moreover, we have had no difficulty in finding ova of strongyles indistinguishable from those present in the suffering calves in the fæces of animals in the best of health and condition. At the first examination the fæces of eighteen animals were examined, and save in two ova were found with ease; of the two animals one had never been out of the stable since it was born two years before. Since this examination Professor Duncan, M.R.C.V.S., of the Royal Agricultural College, Circnester, who was assistant in the Royal Veterinary College of Ireland during a portion of the time the experiments were in progress, and who was perfectly familiar with the parasite present in the dejecta of our experimental animals, at my suggestion examined the fæces of healthy calves in England. He informs me that he has found ova, and in one instance a live strongyle, in the fæces of eight calves out of ten calves examined. It appears, then, that of 28 animals examined-28 animals showing no symptoms of the disease and to all appearances in good health-24 of them were the hosts of strongyles in the alimentary tract. Can the disease be attributed to an enormous invasion of parasites which, when few in number, do little or no harm? In the cases of parasitic gastroenteritis in cattle in England the numbers of parasites appear to be great; in our cases the numbers were never very large, and were as readily found in healthy individuals or more so than in the sick calves.

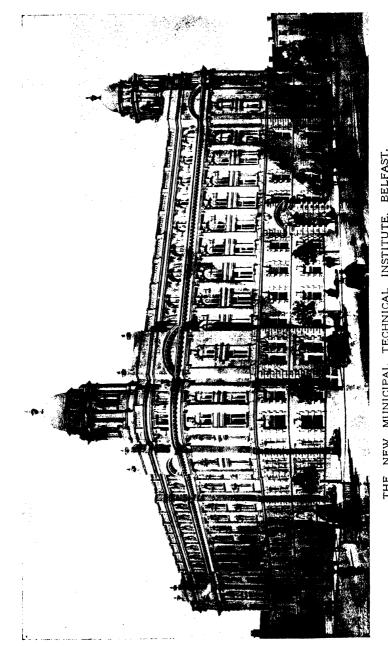
It is, of course, now well known that a severe and very fatal form of gastritis is due to the presence of nematode worms in the fourth stomach, and that such gastritis annually claims many victims, young and adult, cattle and sheep. In none of the records, however, have I observed any reference to the very striking lesion of the gall bladder, such as we found in eleven cases out of thirteen. The increase in size of the gall bladder cannot be assigned to the strongylus gracilis or other strongyle in the abomasum; it was not due to any interference with the flow of bile into the intestine since the bile duct was permeable in every case and allowed ready escape of bile when the bladder was slightly squeezed. The presence of fluke in the liver does not explain it. I have seen hundreds of cases of fluke in the liver, both in sheep and in oxen, but never an enlarged and extended gall bladder as a consequence of their presence. I strongly incline to the opinion that some other cause than fluke will be found to be the cause of this interesting lesion.

(In tropical diarrhoa affecting the human subject, the disease known as psilosis or sprue, it is believed that the diarrhoa is due to the absence of bile from the intestine. The cause of sprue is, so far as I am aware, unknown.)

We have made a prolonged examination of the blood of those animals in our charge, but most of the animals were quite unsuitable for the purposes we had in view. We should like to examine the blood of young bovines born and bred upon infected farms and for some time prior to the development of clinical signs of the disease. The investigation is likely to be a long and a tedious one, but we do not mind the time and trouble if we can arrive at the cause of so serious a malady of young stock. In a preliminary report it may be unwise to offer advice as to prevention of a disease the cause of which we are not certain, but we are already in a position to recommend that the animals be housed for a longer time than has been the custom hitherto, that plenty of good dry food be given and that a clean and dry bed be provided.

I desire to express my thanks to Prof. Wooldridge and his students for the assistance they have kindly rendered me.





THE NEW MUNICIPAL TECHNICAL INSTITUTE, BELFAST. (NOW IN COURSE OF ERECTION, AND TO BE OPENED IN SEPTEMBER, 1996).

#### METHOD IN EDUCATIONAL INSTITUTIONS.

## THE COMPILATION OF TECHNICAL STUDENTS' RECORDS.

By Fras. C. Forth, Assoc. R.C.Sc. Ireland,
Principal of the Municipal Technical Institute, and Director of
Technical Instruction, Belfast.

Probably no decade within the past half century has seen so much development in educational work as that Introduction. through which we are now passing. This expansion will be found to have taken place whatever branch of education is examined, whether it be primary, secondary, technical or university.

In England, Ireland, Scotland and Wales the educational changes brought about by recent legislation have almost revolutionised the methods of the schools, whilst other changes are pending which will no doubt produce still further developments.

One of the results of these changes has been to increase considerably both the number of educational institutions and the number of students attending these institutions, and this is particularly true of Ireland where the rapid growth of technical instruction is probably unprecedented in any previous period of educational progress either in the British Isles or even further afield.

To effectively provide for the steadily increasing demand for greater educational facilities, to adjust school methods to the constantly changing and improving conditions, and to cope with the gratifying and most commendable—at times almost embarrassing—eagerness of students to qualify themselves for higher branches of study has been no light task, and has necessitated unremitting thought, care and attention on the part of technical instruction committees and their officers.

One of the branches of administration in which the utmost elasticity and adaptability has had to be maintained by every

technical institution wishing to control effectively its growing educational work, is that dealing with the registration of students and the recording of their progress.

In this paper it is proposed to describe the phases of development of this branch of administration, and the results arrived at, in the Municipal Technical Institute, Belfast.

The need of a Recording and Registering System.

Whatever may be the nature of the instruction imparted in an educational institution it is obvious that there will be a certain amount of routine to be gone through in compiling records of the work carried on by the institute, as e.g., in the chronicling for ready reference of data

relative to students' attendances, home-work marks, examination results, prizes gained, scholarship successes, and so on; and naturally, the character of the educational work will determine the nature of the records to be kept. It is also plain that the greater the number of students attending an institution the greater will be the necessity for simplicity, adaptability, and exactitude in the recording method employed. The system of recording explained in the following pages has been specially devised to meet the requirements of a large technical institute, and as this system has now stood the test of two years' working it is hoped that a description of it may be of interest to other educational institutions.

The Municipal Technical Institute, Belfast, was established some five years ago, viz., in the year 1901, the introduction of a scheme of technical instruction having been decided upon in that year by the Corporation of Belfast. A number of existing evening classes in science, art, and technology formed the nucleus of the Corporation scheme. It was estimated that in the first year of the Corporation's educational efforts some twelve hundred individual students would enrol themselves, and a plan of recording was devised suitable for about that number. As events proved the number was considerably under-estimated, for the programme of instruction offered by the Corporation met with unhoped for and very gratifying success, and in the first year over three thousand persons joined the various classes. As a consequence it became necessary in the second year to remodel the recording system, and as the increase in the number of students continued into the third year, a further remodelling took place. The system followed in the third year was utilised with some slight emendations, in the fourth year, and

now in the fifth year it is almost stereotyped. A considerable amount of trouble and thought has been expended upon the system in order to adapt it to the various conditions which require to be fulfilled, and as a result a solution of the problem has been obtained, which—so far as present experience goes—indicates the method in use to be satisfactory.

There are two main conditions which must be satisfied by any

Conditions to be fulfilled by an Institute Record. recording system adopted for a technical institute in which there is a large evening division. The first is that the full educational record of any individual student for the current, or any previous, session shall

be readily obtainable, and the second is that the whole of the records for any given class shall be equally readily obtained. The following are some of the reasons why the records should be kept in the manner mentioned:—(1.) Returns have to be prepared annually for the Department of Agriculture and Technical Instruction, e.g., returns bearing upon the occupations and ages of students, subjects studied, examination successes, claims for grants, and so on. (2.) requests are frequently received from students who are seeking situations, asking for certificates of attendance at classes and for statements as to successes at examination. (3.) all the members of a class may need communicating with at short notice, and (4) the whole of the students in the institute may have to be circularised. Still other reasons might be cited, but the above will no doubt suffice.

If a recording system is to be of real value it is essential that any information desired shall be available at a moment's notice, for if searches have to be made much time is spent over each enquiry, by the clerk whose duty it is to deal with the different questions arising.

A little consideration will quickly show how serious the waste of time could become if the system of recording is defective or cumbrous, particularly in an institution with a membership of some five thousand students, with about eight thousand class entries, and with over three hundred and fifty separate classes—these being the numbers for the Belfast Institute for the current year.

It is part of the policy of every technical institute to induce its evening students to take up their studies at the very beginning of the session—the session usually opening in the month of September. This means a great influx of students on the opening days. The experience in Belfast is that fully three-fourths of the session's entries are made within the first three weeks of the evening session. In the succeeding weeks the rate at which students join falls off rapidly.

Now it is not only important that the enrolment of students shall proceed with the minimum expenditure of time, but it is equally important that the entries shall be recorded and classified with the utmost promptness; further, this work should be disposed of daily, for each month of a technical school session brings its own particular duties, and arrears if allowed to accumulate are very difficult to overtake.

The recording system which was employed during the first year of the Belfast Institute's existence was that

Some Lessons of formerly prescribed by the Science and Art

Experience. Department, wherein a large book, or "General Register," was utilised to contain

the records. This proved unsatisfactory mainly because, however great the volume of work, only one person-or at the most two persons—could be engaged on the book at one time. The employment of a book thus resulted in the records falling considerably into arrear and only after the lapse of some months were the entries in the book brought up to date. When devising a plan to overcome this difficulty the first object aimed at was to construct a system which would allow the recording to be divided amongst as many clerks as were required to keep the work well in hand from day to day, and which would at the same time permit of the number of clerks engaged on this duty being gradually reduced as the daily volume of entries decreased. In the case of Belfast the difficulty of dealing with the records was greater than usual, for owing to there being no one building at present capable of accommodating the large number of students enrolled, classes have to be held at ten different centres throughout the city, and as a consequence special methods had to be devised to deal with with this position of affairs. For these reasons the elasticity and divisibility of any system adapted were points of first importance. A further object aimed at was to keep teachers as free as possible from mere clerical work, it being recognised that teachers are most efficiently employed when their energies are devoted to their proper duties, viz., those of teaching. These aims mean of course the delegation of the recording duties to a clerical staff-temporarily augumented during the period of high pressure—which in turn meant that the system had to be as free as possible from complications and technicalities.

With this somewhat lengthy, but it is thought necessary, introductory statement the method devised and now in satisfactory operation can be explained.

About one month before the opening of the evening session of the

The Method in use at the Technical Institute, Belfast.

Municipal Technical Institute, the Time Tables of classes are widely circulated. These Time Tables are supplied gratuitously. A full prospectus detailing the range of instruction to be given in the different subjects is

also placed on sale. Intending students familiarise themselves with such general information as they need, and in the opening week of the session present themselves to the teacher of the class proposed to be joined and are submitted to a preliminary test to ascertain their educational attainments. On receiving the approval of the teacher the student fills in an entrance form. There are two patterns of entrance forms in use, one for art classes, and one for the remaining classes (science, technology, and commerce). A copy of the latter form as in use for the current session is appended.

It may be mentioned in passing that considerable care and trouble was expended in devising these entrance forms. To anyone interested in the organisation of a technical institute the particulars may be usefully studied, for the forms are an essential part of the system now being described.

For art classes the entries to be made differ somewhat from those required for science, etc., so that a specially worded form is used, though the principle on which the form is built up is the same.

The main features of the form for science, technology, etc., classes are the set of "Notes and Hints for Students," and the planning of the spaces for "name," "address," "subject," and other details. It will be noted that the key words for the spaces at the right-hand side are printed in red ink. At the foot of the form, under the heading of "Notes and Hints," is a space reserved for office use only. The purpose of this space will be explained more fully later on. On the back of the form is printed a series of suggestions relative to courses of study.

The entrance form having been duly initialled by the teacher is then presented at the office, together with the class fee, and a numbered class ticket is handed to the student; at the same time the number of the ticket is entered on the form, the form itself being initialled by the ticket-issuing clerk and retained by him.

In size and shape the class ticket is exactly the same as the ticket issued to a passenger on the railway. The Class Ticket.

Class Ticket. tickets for each class in the institute are numbered from "1" upwards.

The number of students admitted to any given class is strictly limited, the limit being fixed by the nature of the subject of

instruction; as a consequence the number of tickets printed for each class is a definite quantity, and when the stock is sold out admission to a class ceases automatically.

The front, and the reverse, of one of the class tickets is shown below:—

Municipal Technical Institute, Belfast.
Principal: FRAS. C. FORTH, Ausoc. R.C.Sc.I.
St8310N 1905-6. (FIFTH 8E8810N).
ADMIT BEARER TO
NAVAL ARCHITECTURE OLASS.
Stage 1.
Working Men's Institute.
Teacher: J. M'F. JOHNSTON.
Tuesday, 7-30 to 9-30 p.m.
FEE—94. 6d. FOR SESSION.
H. H. DUNLOP, F.C.I.S., Registrar.

Students are particularly requested to notify to the Registrar any change of Address.

Fees are in no case returnable.

This Ticket is not transferable.

This Ticket is issued subject to compliance with the Institute conditions as to attendance, &c. It must be initialled by the Teacher when the Student joins the Olass.

The colour of the class tickets is changed each session.

On receiving his ticket the student proceeds to his class, and presents the ticket to the teacher who at once enters the student's name on the Class Attendance Register. The lines in the attendance register are numbered consecutively from top to bottom of the page, beginning with "1," and the student's name is written in the register against the number corresponding to the number on the ticket; a like entry having been made in the Homework Marks Register—which is similarly numbered—and the ticket initialled and returned to the student, the teacher's introductory duty is completed. A student is not permitted to attend a class until he has obtained his class ticket.

Owing to the great influx of students in the opening weeks of the session it is necessary to employ, temporarily, a number of clerks for the issuing of tickets. At the end of each day the various clerks who have been engaged in this duty, hand to the Registrar the cash and entrance forms collected, receiving in return a receipt for the moneys paid in. On the following morning the whole of the entrance forms received the previous day are first checked and are then handed over to the indexing clerk to be indexed. The work of indexing is performed by one of the typists to whom is allotted the duty of compiling the alphabetical index of all students joining the institute.

The process of indexing is as follows:—The indexing clerk first arranges the forms in alphabetical order, and Alphabetical Index then proceeds to type the student's name, of Students.

address, and certain other particulars on a

card, first looking to see if a card has already been made out for the student for as there must be only one index

been made out for the student for as there must be only one index card for each student any subsequent class entry must be noted on the card bearing the first entry. When the new cards are ready they are numbered consecutively with a numbering stamp, in order that the number of individual students who have joined the institute may be known each day. The cards are next distributed into their proper alphabetical positions in the card index trays. Finally the entrance forms are ticked thus, V, to show that they have been indexed, and are then handed over to the register clerk.

A sample of the "Students' Index" card showing the ruling and headings adopted, and a specimen set of entries is shown below.

The colour of the card is changed each session. The size of the card is  $4\frac{7}{8}$ " x 3". This card, like the entrance form, has been specially devised to meet the requirements of the Belfast Institute.

Student's Name	JOHNSON	Robert							
Address	78,	Southport	Street, Be	lfast.					
Age 24 Date of Birth	1/Oct./81	Occup	n. Cle	erk	Ind Rot N	an.}	49	24	
Subject.	Stage or	Note dis- tinguish'g		licket	Term (if any)	EXA	M. R	ES	Prize
Bubjæt.	Grade, etc.	the class	Dianci	No.	session Ex.B.		St.	C1.	122.20
Eng. & Arith.	Prep.	c.	Tent. St.	32	8				
Book-keeping	1	Beg.	N.M.T.I	35	s				
Modern Business Methods	1.	А.	N.M.T.I.	6	s				
French	Beg.	C.	N.M.T.I.	13	s				
·									
Municipal Technical Instit	ute, Belfast.			Pifth S Stude	Session (1 NT's ENT	905-6) RANCE	For	M IN	IDBX.

The main duty of the Register Clerk is to take charge of all entrance forms and to supervise all registers

### The Register Clerk and his Work.

of classes. The Register Clerk on receiving the entrance forms first arranges them by classes, and then groups the forms for each class in numerical (i.e. ticket) order. The

forms are then set vertically behind a tabbed guide card, the tab bearing the name of the class. As already mentioned there is a considerable number of classes, so that the class-groups of forms are themselves arranged in numerical order.

It happens frequently that a student is a member of two or more classes, and in such cases it is a rule that an entrance form must be

filled in by the student for each class joined. There is, however, as already mentioned, only one index card in the alphabetical index.

Experience has proved that this alphabetical indexing of the students' names, as well as the arrangement of the entrance forms by classes, can be done at considerable speed: indeed after the first fortnight of the session the work is practically kept up to date day by day.

If now it is required to ascertain the classes joined by any given student all that is necessary is to refer to the card-index and find the card bearing the student's name. Should it occur that the entrance form filled in by the student is also required it can be picked out at once, as the index card bears the name of the class (or classes) joined, and also the class-ticket number, hence the form itself can be immediately found by reference to the "class" records.

As a detail closely connected with the institute organisation, and

#### Class Attendance Returns from Teachers.

illustrating one of the uses of the recording system, it may be mentioned that teachers of evening classes are required to send in periodical returns--monthly and monthly—showing the gross number

students on their class-roll, the not number on the roll, the attendance at each lesson during the period reported upon, and the names of those students who have been absent from two consecutive lessons. These reports enable students attending irregularly to be at once located, and a system of postcarding is in operation for recalling negligent students to a sense of their duty. The work of despatching cards to absentees is dealt with by the Register Clerk. Students who do not attend with reasonable regularity have their names removed from the register; the system on which this is done is explained on the back of the Report Form, copy of which is appended.

#### Notifications to Students attending irregularly.

When the system of communicating with absentees was first inaugurated a student was written to three times before his name was removed from the register, a "reminder" card being first sent, then a "second" notice, and then a "final" notice. Now that students have had fuller

opportunities of becoming acquainted with the Institute's regulations and the whole system is more completely organised, only two notices will be sent and if a student does not then reply or furnish a reasonable explanation of his absence his place in the class will be filled.

## MUNICIPAL TECHNICAL INSTITUTE, BELFAST. SESSION 190 -190 .



SUBJECT	(N. 1947)		
DAYTIMI	(min 10	p.m.	
TEACHER'S MONTHLY REPORT.	TEACHER'S REPO	- Total Control of the Control of th	·
(10 be sent in at the conclusion of the last lesson in each month, so as to be received in the office on the following morning).	sent in twice a month, viz.1—Alt in eac following Students having been a	h month.	
VTH,	R-REMINDER.	F-FINAL NOTICE.	
ting held during ding Sat., the	STUDENT'S NAME.	times Notice absent to be REMARKS. onsecu- tively.	only). REPLIES.
a on Roll			
.t No. on Roll			
No. Present al Lesson			
No. of Homework Exercises received from Students.	Mar Mari Mari		
TEACHER'S OBSERVATIONS ON WORK OF STUDENTS DURING MONTH-			
(1.) Attention to Class Work.			
(a) Home Work.			
(3) Regularity and Practitality,			
(4) Services of Austrant (if one respilet).			
(a) Any miscillaneous observations.			
SIGNED,		the back for continuation of this list).	1.42

### Directions for Teachers.

#### MONTHLY CLASS REPORT. ABSENTEE REPORT

MONTHLY CLASS REPORT.-The Directions for preparing and forwarding this Report are indicated on opposite page. The Monthly Class Return will commence with the last lesson in the month of September of each Session.

ABSENTEE REPORT. - There are two forms of Absentee notice :-

The First (or Reminder) notice, and The Second (or Final) notice.

The Absentee Reports will commence with the Second Lesson in October of each Session.

In dealing with the notification of absentees the following practice is to be followed:-

1. When a student has been absent at least twice consecutively, his name should be noted on the Absentee Form as a student to receive a first, or Reminder, card. In order that you may have a record in your Register of all students written to, put, in ink, a small letter R (= Reminder) against each student's last recorded absence mark.

On receipt of your Absentee Report in the Office, the Reminder card will be at once despatched. If a reply is received, it will be forwarded to you. If the reply explains the reason for absence, and indicates that the student purposes resuming attendance, you are asked to make a note in the Register of the reason given, after the last recorded absence mark. The note should be written in pencil. If you do not receive a reply, it may be taken that no reply has been received in

2. If the student resumes attendance no further action is necessary, but should he neither resume attendance, nor send a satisfactory reply, then when furnishing your next Absentee Report enter this student as requiring a Final notice. When filling in the Form put a small letter F

(= Final notice) against the last recorded absence mark in the Register.

- 3. If at the next meeting but one of your class the student does not present himself, and no satisfactory explanation is forthcoming, write on the Register, after the last recorded absence mark, "Name removed from Register." This entry to be in ink. Should the student present himself at a subsequent lesson his name must not be reinstated. The student must be informed that his name is removed from the Register, and that he cannot resume attendance until he has written to the Principal and explained his neglect to reply to the enquiries sent to him. If the restoration of the student's name to the Register is authorised, a letter to that effect will be specially sent to you.
- 4. If during the period of absence the student writes saying that he does not purpose continuing his studies, the word "Left" should be written after the last recorded absence mark.
- 5. The utmost care should be taken that all replies sent to you are noted in the Register, as to make further enquiry when a good reason for absence has been supplied is liable to lead to unpleasantness with students. Students' replies need not be returned to the Office.

6. It is particularly asked that teachers will follow out the system with the utmost closeness. so that uniformity of method may prevail throughout the Institute.

7. Unless accompanied by some satisfactory explanation, a long string of absence marks following a student's name should be looked upon as a distinct blemish on a class register.

- 8. If, owing to some exceptional circumstance, a teacher desires to send in an Interire Absentee Report, it will be quite in order to do so, and the Report will be dealt with in the usual manner. Where special circumstances demand it, cards will be sent, on request, to students who have been absent once only.
- 9. If there are no absentees to report, the Report Form should nevertheless be forwarded; that case bearing a notification that there is nothing to report. This will account for your class, and will let it be understood that the Report has not been overlooked.

10. If it becomes necessary to modify these instructions in any particular, information of the

change will be circulated to teachers.

11. It is desirable that you should explain to your class, at about the second or third meeting in the Session, the extreme importance of punctual and regular attendance. At the time, please explain the Prize Scheme as detailed in the "Student's Guide to Prizes and School

#### intinuation of Ahrantaa Tine

Ticket No.	STUDENT'S NAME.	No. of times absent consecu- tively.	Notice to be sent.	REMARKS	(Fot Office use only). REPLIES.
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It should be explained that many of the students who do not attend regularly have good and sufficient reasons for their absences, such, e.g., as working overtime, working out of town, illness, and so on, but much of the falling away in attendance at evening classes is due to lack of perseverance. It is hoped that this weakness will disappear as students become more accustomed to study.

The form of postcard sent out is shown below. The "First notice" card is printed in black, the "Final notice" card is printed in red. The card is sent to the student enclosed in an unsealed envelope.

#### FIRST NOTICE.

M		190
Ticket No.		Class.
,	Stage	Branch
the above-name is not due to il resume your st. and that you w attendance uni Should you your absence, space below.	ore than one of the cold Class. In hopin livess, I trust that undies at the next mould continue in regult the close of the convish to send me of you might do so on yours faithfully,	g that your absence you will be able to ecting of the Class, ular and punctual ourse of instruction ony explanation of
7 (677)		ORTH, Principal.
REPLY.		

#### FINAL NOTICE.

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	et No		•		
		Stage_		Bra	nch.

We wrote to you recently making enquiry regarding your absence from the above-named Class. If you purpose resuming your attendance, you will favour me very much if you will let me have a note to that effect within the next three days. Should you find yourself unable to resume attendance perhaps you will inform me, in order that we may proceed to fill your place in the Class.

In this connection I would like to draw your attention to a paragraph in the Prospectus, dealing with the conditions upon which Students are admitted to membership of the Institute. The paragraph reads as follows:—

"The accommodation in each Class being limited, Students admitted to a Class are expected to be regular and punctual in attendance. Except where a letter of explanation has been forwarded, a Student who is absent consecutively from three lessons is liable to have his name taken off the Register and his place in the Class filled."

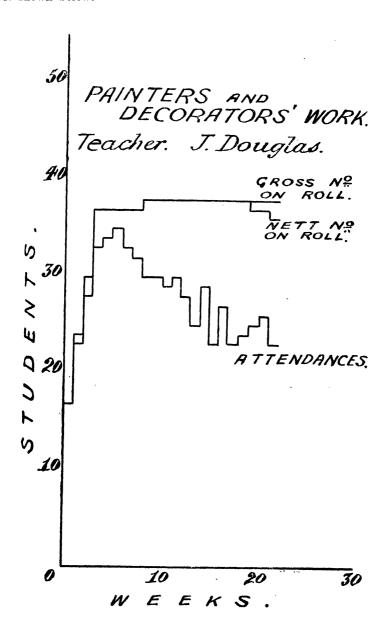
I am, yours faithfully,

FRAS. C. FORTH,

Principal.

In order to display in a condensed form the attendances made at
each class throughout the institute it is the
Graphical practice periodically to plot on squared paper
Representation of Class the numbers on the roll and the weekly class
Attendances. attendances for each class. The figures from
which these diagrams are plotted are taken
from the monthly returns above referred to. These diagrams are

found exceedingly useful, as they enable a rapid survey to be obtained of the attendance at the whole of the classes in the institute, and such classes as show any exceptional falling off in attendances can be specially looked to. A specimen of one of these diagrams is shown below.



At the end of the session the class attendance registers and the

homework market close of the Session entries are m

and Records of Students' Work.

homework marks registers are collected, and entries are made on each student's entrance form of the attendance made and the homework marks gained. Any prize or other special award won by the student is also

noted on the entrance form, the record being thus made complete in all respects.

If at any future time the student's record is required all that is necessary is to refer to the form in the manner already described and full particulars are at once available.

Judging from the foregoing description it may be thought that
the recording system is very complicated but
in practice the whole of these operations are
carried out with far less labour and in much
less time than was expended when the large
book, or "General Register" was in use, moreover the exactitude
in indexing which is possible by the vertical filing system enables
any information required to be found without a moment's delay.
The simplicity of the system has unquestionably tended to a smoothness and accuracy of working in the office which did not exist before

The alphabetical card index already described is known as the "Current Index," but there is also an General Alphabetical alphabetical index known as the "General Card Index." the object of which is now to be explained.

the introduction of the present arrangements.

For various purposes, as for example the awarding of prizes and scholarships, the granting of certificates for courses of study, and so on, it is requisite to be able to ascertain full information regarding the whole course of study pursued by any student, even though this course extended over several years and these years were not consecutive. To be able to obtain such a record at a moment's notice is therefore a matter of importance. This information is found in the general index. The general index is formed by arranging together in strict alphabetical order the cards for all the past sessions. By this means cards for any given student are brought into juxtaposition, and the students whole educational history is traceable at a

glance. The most recent card is placed in the front. When making reference to a general index the difference of colour of the cards for the different years is found very helpful.

In connection with the Belfast Municipal Technical Institute
there is a Day School for boys; this is

Trade Preparatory called the Trade Preparatory School. The
organisation of this school being special, and
differing in many respects from the organisa-

tion of the evening classes, special methods of recording are in use. The card and vertical filing arrangement was considered to be most suitable and was therefore introduced, and the experience gained up to the present shows this system to be working very satisfactorily. Special cards had to be devised and it may be remarked in passing that, as in the case of the evening classes, the time devoted at the beginning to careful planning of the cards proves to have been well and most usefully expended.

As the Trade Preparatory School in Belfast was the first of its kind to be established in Ireland, and as the number of such schools conducted under the auspices of the Department of Agriculture and Technical Instruction is steadily increasing, the cards used may be of more than local interest, copies are consequently appended.

The cards measure 8" by 5" and are of two kinds, viz:---

- (a). The "Alphabetical List of Pupils" card, containing in alphabetical order the names of all the pupils in each year of the course. The course of instruction is of four years' duration, and to make reference as speedy as possible different colours (first year, yellow; second year, blue; third year, buff; and fourth year, white) are employed for the cards of the first, second, third, and fourth years, respectively, though the printed matter is precisely the same for each year.
- (b.) The "Pupil's Record" card, containing the complete record of the individual pupil for the whole of his four years' course, or for such shorter period as he remains in the school. One of these "Record" cards is of course assigned to each pupil. These cards are white.

The "Record" cards for pupils in actual attendance are stored separately from the cards of those pupils who have left the school.

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## BACK OF CARD.

Although the school has only been in existence some two and a half years, the utility of the "Pupil's Record" card has been already tested on quite a number of occasions. For example, when a testimonial is asked for by an ex-pupil, or a reference is wanted by a prospective employer of a pupil, the "Pupil's Record" card is referred to, and the statement supplied is based on the entries The nature of the entries can be seen by an appearing there. the card illustrated. It will examination of be observed that these records enable employers to be supplied with a plain and unbiassed statement as to a pupil's abilities, and one not dependent on the mere recollection, or possible leanings, of an individual. The card arrangement renders the record available at any time, whether it be months or years since the pupil left the school.

The card system of indexing and the vertical filing system are

Other uses of the freely employed in other branches of the ad
"Card" and Vertical ministrative work of the institute, and the

Filing Systems. following uses may be referred to:—

The correspondence is stored on the vertical filing system, the advantages of this system over the old copy letter-book, which was first used, being most marked.

The books belonging to the Institute Library are catalogued on the card system.

A large collection of lantern slides has been catalogued by means of cards, but with certain modifications necessary to make the system suitable to the special requirements of a technical institute. As is well known to everyone who has experience in the management of a technical institute in which lantern slides are at all freely used, the difficulty of finding any given lantern slide in a reasonable time is usually very considerable; the system of card indexing has removed much of this difficulty and has rendered the finding of a slide almost as easy as the finding of a library book.

The type-writing machine and the neostyle are extensively used in the office, and are found to expedite very materially the labours of the clerical staff.

As will have been gathered from the preceding pages, the work of

registration and recording is divided into

sections, each section being placed in charge

System. of a member of the office staff. This sub
division of the work has enabled each clerk
to keep a close watch upon the details of the duty assigned to him,
and as a result of the care and thought devoted to the performance
of these duties useful suggestions for the improvement of the system
and for the elimination of defects have been made from time to time.



#### I.-AGRICULTURE.

Form A. 133 (a.)

#### DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

#### ROYAL COLLEGE OF SCIENCE, DUBLIN. Session 1906-7.

#### SCHOLARSHIPS FOR STUDENTS IN AGRICULTURE.

A limited number of scholarships will be offered for competition among young men in Ireland who desire to acquire a thorough knowledge of technical Agriculture. Each scholarship includes— (1) free admission to the first year's course of instruction in the College, (2) one third-class railway fare to Dublin at the beginning of the session, and one third-class fare from Dublin at the end of the session, and (3) either of the following at the option of the Department—(a) a maintenance allowance of one guinea per week while in attendance at the College; or (b) free board and residence at the Albert Agricultural College, Glasnevin; in the latter case a small grant will be made to each student towards the cost of books and apparatus.

A scholarship is tenable for one year, but selected candidates must undergo a probationary course of one term of about three If satisfactory progress be made by the holder, the months. scholarship may be renewed for a second, and even for a third year, to enable the student to complete the agricultural course at the College.

The Department do not undertake to employ, or find employ-

ment for, students at the close of the period of training.

Holders of these scholarships will be subject to the regulations made from time to time at the Royal College of Science, and will be required to devote their whole time to the work of the College Courses in the Faculty of Agriculture.

Candidates, who should be between 18 and 30 years of age, must make application on a form, which may be obtained from the Registrar, Royal College of Science, Dublin, after the 1st February, 1906, and which should be returned not later than the 15th August, 1906.

Candidates must have been born in Ireland or have been resident in Ireland for three years immediately prior to the 1st June, 1906. The examination will take place at the Royal College of Science, Stephen's Green, Dublin, on the 5th and 6th September, 1906, and at the Albert Agricultural College, Glasnevin, on the 7th September, commencing each day at 10.0 a.m. No expenses in connexion with attendance at this examination will be allowed.

Candidates will be tested in the following: -

#### A .-- English.

- (1) Composition, to be tested by an essay.
- (2) Grammar, Etymology, and the principles of Syntax.
- (3) Literature, the following works:—(a) Macaulay's "Warren Hastings" (Intermediate School Texts, Browne and Nolan); (b) Goldsmith, "The Traveller" and "The Deserted Village."
  - B. One of the following: -

LATIN;

IRISH;

FRENCH:

GERMAN.

In these languages the papers will comprise—

(1) Passages for translation from the following texts:—

Latin—Cæsar, "De Bello Gallico" (Book IV.).

Irish—Séamur tia Outgaill, "Catain Connoi 7 Széalta eile."

French-Mairet, "La Tâche du Petit Pierre," edited by Barrère.

German-Anderson, "Bilderbuch ohne Bilder."

- (2) Easy passages for translation into English from other texts.
- (3) Questions in Grammar—Accidence and the principal rules of Syntax.
- (4) Short sentences for translation from English.

#### C .- MATHEMATICS.

(1) Arithmetic-including elementary Mensuration.

(2) Algebra—to quadratic equations inclusive;

(3) Plane Geometry—to be tested partly by questions requiring formal proofs of propositions from Euclid I.-III., and partly by practical problems to be solved by compass and scale of equal parts.

#### D.-PRACTICAL AGRICULTURE.

Each applicant must have had substantial experience in the practical working of a farm. No technical knowledge will be

expected. The examination may be written, oral, and practical. The subjects will include all the ordinary routine work as practised on a dairy or tillage farm in Ireland.

N.B.—On no account will a scholarship be awarded to a candidate who fails to attain a high standard in this portion of the examination; while excellence in this subject will be taken into consideration in case of deficiency in one or more of the others.

#### E .- ABILITY TO IMPART INSTRUCTION.

Gauged by the style of answers in both written and oral examinations.

Last date for receiving applications, 31st August, 1906.

A 59

## DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

Scheme for Encouraging Improvement in the Dairy Cattle of Ireland through the Selection and Registration of Cows, 1906.

- 1. Dairying, as well as the raising of store cattle, is one of the principal branches of agriculture pursued in this country. It is, accordingly, of importance that the milking properties of Irish cattle should be preserved and improved. In dairy herds the yield and quality of milk given by each cow largely determine whether that animal realises a profit or entails a loss to the owner; consequently it is essential that farmers should know exactly the quantity and quality of milk which each cow yields per annum. At the same time, as young cattle are a considerable source of revenue, it is desirable that the good milking cow should be of the type likely to produce a calf which will be of value for both beef and milk. With the object of encouraging the improvement of Irish dairy cattle, the Department have decided to put into operation the following scheme.
- 2. The Department will keep a register of cows selected subject to the provisions of this scheme. The inspection of cows with a view to entry on this register will be carried out by the Department.
- 3. Owners of good cross-bred and pure-bred dairy cows are invited to apply on the prescribed form for the inspection of their stock by the Department as regards—
  - (a) General merit (i.e., appearance), and

(b) Milk yield.

Only cows of a distinct and well-defined type are eligible,

4. Application for inspection of cows must be made on the prescribed form, and must be accompanied by a fee of 2s. 6d. in respect of each cow entered for inspection. Only such animals as are mentioned on said form will be inspected.

Applications must be lodged with the Department on or before

31st March, 1906.

As soon as all the applications have been received the Department will give due notice to the owners of cows of the centre fixed for the inspection of their animals.

5. There will be two inspections of cows for the purposes of this scheme.

At the first inspection animals will be provisionally selected, on the ground of general merit. This inspection will be made at local shows, local exhibitions, or at such other convenient centres as may be determined by the Department. All animals provisionally selected for general merit under this scheme will be suitably marked by the Department for future identification.

With regard to inspections elsewhere than at local shows, it should be understood that the Department, save in exceptional cases, cannot undertake to send an Inspector to any district unless at least ten cows from such district are offered for inspection.

The cows so selected will be inspected a second time during the season at their owner's residence, as to quantity and quality of milk yield. Cows which pass on the result of this second inspection will be further marked and numbered by the Department, and will then be eligible for entry on the register.

- 6. Owners of cows provisionally selected under Clause 5 are required to observe the following conditions:—
  - (a) To provide themselves with an approved type of machine for weighing milk;
  - (b) To weigh the milk yielded by each cow on every seventh day during the entire milking period (the exact day of the week for each herd will be fixed by the Department), and to record the same on the form provided for the purpose;
  - (c) To permit their herds to be inspected by the Department at any time, and to afford the Department every facility for testing the quality as well as the quantity of milk yielded by the selected animals;
  - (d) To keep, on the prescribed form, a record of the breeding and dates of birth of produce, for the purposes of future registration.
- 7. Each registered cow must be served by a pure-bred bull of her own type passed by the Department as eligible for a premium.

A certificate of service on the prescribed form shall be forwarded to the Department within three months from the date of such service.

8. The female progeny from the service of registered cows by approved pure-bred bulls will be eligible for inspection at or about two years old.

9. As soon as a registered cow produces a calf, particulars regarding sex, colour, markings, &c., of the calf shall be furnished

to the Department on the form provided for the purpose.

10. When a registered cow or her calf has been disposed of, the Department must be notified of the fact within fourteen days of the disposal of the animal, and at the same time advised of the name and address of the new owner.

The death of a registered cow or her calf must also be notified to the Department within fourteen days of the death of the animal.

11. In all cases of dispute in matters connected with this scheme the decision of the Department shall be final.

### DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

### IMPROVEMENT IN THE MANAGEMENT OF CREAMERIES.

I. REGULATIONS, 1906-7.	Page
1. Registration of Creameries and Auxiliaries,	501
2. Visits to Creameries of Instructors in Dairying, .	502
3. Winter Courses of Dairy Technology,	503
4. Creamery Managers' Certificates,	503
5. Surprise Butter Competitions,	510
IILIST OF HOLDERS OF THE DEPARTMENT'S CREAMERY	
Managers' Certificates, whose Certificates	
HAVE BEEN RENEWED IN 1906,	517
III.—REGISTER OF CREAMERIES, 1905-6,	518

With a view to encourage and assist improvement in the very important work of the management of creameries, the Department have decided:—

- (1.) To publish annually a Register of suitably equipped and well-managed creameries and auxiliaries.
- (2.) To arrange for visits of the Department's Instructors in Dairying to creameries and auxiliaries.
- (3.) To make provision during the winter for courses of instruction in dairy technology, with special reference to creamery management.
- (4.) To award certificates of competency to creamery managers under prescribed conditions.
- (5.) To hold annually a series of surprise butter competitions.

<sup>\*</sup> Throughout these regulations the term " creamery " does not include auxiliaries where milk is separated and the cream sent elsewhere to be made into butter.

#### I.—REGULATIONS, 1906-7.\*

1. Registration of Creameries and Auxiliaries.

The Department are prepared to consider applications for the Registration of creameries and auxiliaries from managers and proprietors who desire to have their management recognised by the Department as efficient, and who may be in a position to train one or more pupils.

Applications from apprentices or pupils in creameries for admission to the examination for the Department's Creamery Managers' Certificates will be considered only in the case of those who have been trained in Registered Creameries under approved managers. (See page 6, et seq.)

The requirements for Registration in the case of creameries are: ---

(1.) That the manager is capable.

(2.) That strict cleanliness and order are manifest around the creamery, in the creamery, and in the persons of manager, employés, and pupils.

(3.) That a proper system of bookkeeping and business

methods is in operation.

(4.) That the buildings and equipment are suitable.

(5.) That the premises and methods are at all times open to inspection by the Department.

(6.) That defects indicated by the Department's Inspectors and Instructors are remedied with the least possible delay.

[As the Department would not feel warranted in incurring the expense of repeatedly inspecting creameries and auxiliaries the proprietors or managers of which show no inclination to carry out nnecessary improvements indicated by the Department's Inspectors and Instructors, applications from creameries and auxiliaries which have been entered for Registration in previous years and are not included in the Department's Register for 1905–6 must be accompanied by a statement of the efforts which have since been made towards effecting the requisite improvement in each case.]

- (7.) That the butter packages in general use are satisfactory.
- (8.) That apprentices and pupils (if any) receive efficient training and instruction.
- (9.) That the creamery is entered for the Department's Surprise Butter Competitions in 1906.

[Failure to forward duly an Exhibit for any one Competition will—except in circumstances which, in the opinion of the Department, afford a satisfactory excuse for such failure—disqualify a creamery for Registration].

<sup>\*</sup> For some important modifications proposed in the Regulations to come into operation in 1907-8, see p. 513.

<sup>†</sup> See footnote on page 500.

Registration of auxiliaries will be granted in the cases which fulfil the foregoing conditions (1) to (6) inclusive.

AU creameries and auxiliaries, whether co-operative, joint-stock, or proprietary may be entered for Registration.

Inspection of the creameries and auxiliaries will take place as speedily as possible.

The Register, which is subject to annual revision, is published annually, and contains the names of each creamery and auxiliary accepted for Registration on the result of the previous year's inspections, as well as the names of the manager, and of the president, chairman, proprietor, or general manager of the creamery or auxiliary. The Register for 1906-7, which will be published early in 1907, will be divided into two classes, viz., First Class and Second Class. In the First Class will be included only those creameries and auxiliaries which, during the period covered by the 1906 Inspections, have been maintained in a highly satisfactory condition in regard to all the requirements of the Scheme as set forth above. In the Second Class will be included those creameries and auxiliaries which, while failing to attain to as high a level of efficiency as those of the First Class, and accordingly requiring improvement to a greater or less extent, are nevertheless considered by the Department to merit recognition as having to a passable degree complied with the requirements of the Scheme. In considering applications for Registration the Department attach much more importance to cleanliness and order than to elaborate and expensive equipment. At the same time due consideration is given to the provision of an efficient equipment.

The Department may, without assigning any reason, refuse to inspect or to register any creamery or auxiliary, and in all cases of dispute the Department's decision shall be final.

Applications for the Registration of creameries and auxiliaries must be made on Form A 136, to be obtained from the Department, Upper Merrion-street, Dublin. The Forms, accurately filled in, should be forwarded so as to reach the offices of the Department on or before the last day of March, 1906. Applications after this date may be considered from managers who, having duly applied for the Registration of their creameries or auxiliaries, subsequently remove to creameries or auxiliaries which have not applied for Registration, but no such applications can be entertained later than 1st May, 1906.

#### 2. Visits to Creameries of Instructors in Dairying.

With a view to increase the existing facilities for obtaining technical advice and assistance in the management of creameries,

the Department have made arrangements by which proprietors can have their creameries and auxiliaries periodically visited free of charge by Instructors in Dairying, appointed by the Department. Under these arrangements all creameries and auxiliaries, whether co-operative, proprietary, or joint stock, and whether entered for Registration or not, from which applications on Form A/175 are duly received and accepted by the Department, are visited periodically by the Department's Instructors. On the occasion of each visit all necessary advice is afforded on matters relating to the dairying operations.

It is not necessary that applications on Form A/175 should be renewed annually. Creameries and auxiliaries from which applications on this form are accepted will be retained on the list of those to be visited by the Department's Instructors until notification is given to the contrary. The Department, however, reserve the right to remove from the list at any time creameries or auxiliaries the proprietors or managers of which evince no desire to profit by the instruction afforded.

Applications for visits of the Instructors for any special purpose, c.g., the preparation of sketch plans and notes for creamery buildings, or suggestions for specifications for machinery, should be made on Form A/174. It is, however, to be understood that except in cases of special urgency applications of this nature cannot receive prior attention to those made on Form A/175.

The Department may, without assigning any reason, refuse to send an Instructor to any creamery or auxiliary.

#### 3. Winter Courses of Instruction.

During winter, courses of instruction in the subjects of examination for the Creamery Managers' Certificates may be provided.

Attendance at the annual course of instruction for students of agriculture provided at the Albert Agricultural College, Glasnevin, is recommended as a preliminary general training for young men who may intend to become creamery managers.

#### 4. Creamery Managers' Certificates.

It is proposed to hold annually in March an examination for these certificates. The subjects of the examination are set forth on pages 505 to 510 of this pamphlet. Due notice of time and place will be given to applicants.

To the examination in 1907 will be admitted—

(a.) Persons who for the whole season\* immediately preceding the examination have managed a registered creamery† to the satisfaction of the Department.

<sup>\*</sup> The Season shall be considered to begin on 1st May and to terminate on 31st October.

<sup>†</sup> See footnote page 500.

- (b.) Assistant-managers, apprentices, and pupils who for the whole season immediately preceding the examination have worked in a registered creamery\* under an approved manager,† and who furnish a satisfactory certificate from him.
- (c.) Persons who for the whole season immediately preceding the examination have managed a registered auxiliary to the satisfaction of the Department.
- (d.) Students who have attended a full winter course of instruction approved by the Department.

[The following courses will be approved for the examination to be held in 1907—

- (1.) The courses for creamery managers provided at the Albert Agricultural College, Glasnovin, since 1902-3, inclusive.
- (2.) Any course of instruction during the winter 1906-7, which the Department may notify, at a later date, as approved.]

The Creamery Managers' Certificate will be granted to candidates of class (a) who are successful at the examination. A provisional certificate, which—on application being duly made—will be exchanged for the Creamery Managers' Certificate after the holder has, to the satisfaction of the Department, managed a registered creamery for at least one whole season, will be granted to the successful candidates of classes (b), (c), and (d).

The Managers' Certificate is valid only for the year in which it is issued. New Certificates will, however, be issued annually by the Department to holders of lapsed Certificates on the condition that the holder in each case shows that he has managed for the preceding season a creamery registered by the Department on the results of that season's inspections.

Candidates must satisfy the Department that they are at least twenty years of age on the last day of January previous to the examination.

Applications for admission to the examination should be made not later than 31st January, 1907, on Form A 137, to be obtained from the Department, and must be accompanied by a deposit of £1, which will be returned if the candidate presents himself for examination, or if his application is not accepted.

Copies of the Forms of Certificate issued to successful candidates in 1905 are printed on page 514 of this pamphlet.

A list of Technical Schools in which instruction is given in one or more of the subjects of the examination for the Certificates is printed on page 515 of this pamphlet.

<sup>\*</sup> See footnote page 500.

<sup>†</sup> An approved Manager is one who possesses the qualifications set forth in foregoing clause (a).

#### Subjects of Examination for Creamery Managers' Certificates.

N.B.—The Text Books mentioned within brackets thus [ ] under each subject will be found useful by candidates. The latest editions of these books can be obtained through any bookseller, and the various Acts of Parliament may be procured from Messrs. Ponsonby, Grafton-street, Dublin. Candidates should also carefully read the pamphlets and leaflets issued by the Department. It is not possible to obtain books which adequately cover the subjects of the examination, and it is to be understood that the questions will in every case be set from the Syllabus and not from Text Books.

#### i.-DAIRY FARMING.

Soils.

Suitability for dairy farming.

Crops.

Pasture, hay, green crops, forage crops, grain crops.

Fertility of Soil.

Sources of gain and loss to soil.

Farmyard manure.

Artificial manure.

Stock.

Pure-bred and half-bred cattle: suitability for dairying purposes.

Selection of bull, of milk cows, of heifers.

Calf rearing.

Pigs: breeding and management.

Housing of Stock.

Cow-houses, best types.

Improvement of existing cow-houses.

Calf-houses.

Pig-houses.

Shelter sheds.

Foods and Feeding.

Home-grown and purchased foods: composition and uses.

Manurial value of feeding stuffs.

Separated milk and butter-milk as feeding stuffs.

Milk Production.

Circumstances affecting quantity and quality of milk.

Summer and winter dairying.

Diseases of Stock.

The common ailments affecting dairy stock.

[" The Elements of Farming," Primrose M'Connell. (Vinton & Co.). Priece, 2s. 6d.]

#### ii.—PHYSICAL SCIENCE.

#### Physics.

Weighing and measuring.

The balance.

Graduated vessels.

Solids, liquids, gases.

Density, hydrometers.

The spring balance as a force-meter.

Friction, lubricants.

Centrifugal force.

Work and power—their measurement.

Fluid pressure: pumps, syphons, wells. Effect of heat on the properties of matter.

Temperature and thermometers.

Evaporation and condensation.

Transfer of heat—conduction, convection, and radiation.

Heat a measurable quantity.

Units of heat, specific heat, latent heat.

Relation between pressure and boiling point.

Refrigeration—principles involved.

Heat and work.

Heat a form of energy.

[" Introductory Physics," Gregory & Simmons. (Macmillan & Co.).
Price 2s.

Omit § § 10, 11, 14, 15, 16, 80, 81, 91, 92, 128, 129, 130; and chapters VII. and XI.].

#### Chemistry.

Fundamental principles.

Indestructibility of matter.

Simple and compound substances.

Chemical change.

Solution; precipitation; filtration; oxidation; reduction.

The atomic theory.

Chemical nomenclature.

The Atmosphere.—Its composition; part it plays in combustion, and in vital changes.

Water.—Composition, physical and chemical properties; natural waters.

Bases, acids, and salts: acidity and alkalinity—quantitative determination.

General knowledge of the Elementary Chemistry of the following substances and their compounds as met with in dairying:—

Potash, soda, lime, magnesia, ammonia, sulphuric acid, hydrochloric acid, borax, and boracic acid.

Lactic, butyric, and salicylic acids, formalin, amyl alcohol, albumen, casein, fats, milk-sugar.

["Elementary Chemistry," Furneaux. (Longmans). Price 2s. 6d.
Omit § § 171, 181, 182, 219, 220, 221, 222, 223, 224; and chapters
XXII., XXIII., XXIV., XXV.].

#### iii. - DAIRY BACTERIOLOGY.

Microscopical study of milk.

Experimental proof that souring of milk is due to bacterial activity.

Sources of bacterial contamination.

Care of milk; influence of temperature upon the keeping qualities of milk.

Biology of the commoner forms of bacteria, yeasts, and mould fungi.

Cultivation of bacteria and moulds; preparation of pure cultures.

Disinfection and application of disinfectants.

Bacterial examination of air, water, and dust.

Injurious bacteria of milk; milk in relation to disease.

Defects in milk due to improper feeding of cows.

Methods of preserving milk: pasteurisation, sterilisation, filtration, refrigeration.

Objections to the use of chemical preservatives.

Cream-ripening; use of "starters."

Importance of extreme cleanliness in dairies.

Comparison of the bacterial contents of good and bad keeping butters.

Bacterial faults in butter.

Coagulation of milk.

The part played by unorganised ferments and by bacteria, yeasts and moulds in cheese-ripening.

Comparison of the ripening changes that take place in hard and in soft cheeses.

Faults in cheese due to bacterial agency.

Bacterial treatment of creamery sewage.

["Outlines of Dairy Bacteriology," H. L. Russell. (The author, Madison, Wisconsin, U.S.A.). Price 4s. 6d.
Or,—"Bacteria in Milk and its products," H. W. Conn. (P. Blackistons, Son & Co., Philadelphia).]

# iv. - DATRY TECHNOLOGY.

Composition and properties of milk and its products, and of their constituents.

Causes of variation in milk.

Changes produced in milk and its products by heat and bacteria. Physical characteristics of good milk, cream, and butter.

Sampling at farm and creamery; testing and analysis of milk, cream, butter, and cheese.

Acidity and its estimation.

Factory tests for quality of milk.

Physical and chemical changes involved in the manufacture of cream, butter, and cheese.

Preservation, conveyance, and marketing of milk.

Cream raising and separation; the cream trade.

Ripening of cream.

Churning: conditions influencing yield and quality of butter. Washing, salting, and working of butter; packing for market.

Conditions affecting quality of butter.

Chilling, and cold storage.

Separated milk and butter-milk: uses and value.

Standards of quality for milk, cream, butter, butter-milk.

Hard and soft cheese making: principles of manufacture; ripening and storage.

[" Milk and its Products," Henry II. Wing. (Macmillan & Co.). Price

Omit pages 270 to 288. Or,-" Creamery Buttermaking," John Michels. (The author, Lansing. Michigan, U.S.A.). Price 5s.]

#### v. - DAIRY ENGINEERING.

#### Buildings for Creameries.

Selection of site; general arrangement of a creamery to facilitate work; space required.

Plans of creameries. Building materials.

Ventilation; lighting; drainage.

Approximate cost.

# Water Supply.

Source; selection of a site for wells; sinking and lining of wells; artesian wells; suitability of water for dairy purposes; means of purification; storage.

#### Sewage.

Methods of disposing of creamery sewage.

# Machinery.

Elementary fitting; packing of glands; adjustment of bearings; shafting and brackets; lining up of machines; tools required in a creamery.

#### Boilers.

Types of boilers; advantages and disadvantages of each.

Size of boiler needed for central and auxiliary creameries; evaporative power.

Insulation and setting of boilers.

Fittings attached to boilers; their use and care.

Usual defects in boilers.

Firing and care of boiler; cleaning.

Use of water-purifier.

Various methods of economising steam.

Feed-water heaters.

#### Coal.

Evaporative power of various qualities.

How to judge coal.

Consumption of fuel; economical stoking.

# Chimneys.

Steel and brick; approximate cost; advantages and disadvantages of each.

# Steam Engine.

Construction and management of ordinary non-condensing engine.

Power required; steam consumption.

Lubrication.

Oils, greases, &c. Oil holders and filters.

#### Machines.

Various types of weighing machines, heaters, regenerative heaters, coolers, separators, tanks, vats, churns, pumps, butter-workers, refrigerating plants.

Their capacity, construction, and approximate cost.

## Arrangement of Machinery.

Transmission of power.

Care of belts; belt fasteners.

Pulleys and gearing.

Speed of various machines, and description of methods for increasing and reducing speed in machinery.

## Arrangement of Work in a Creamery.

Hands required.

[" Elementary Manual on Steam and the Steam Engine," Professor Jamieson. (C. Griffin & Co.). Price 3s. 6d. Omit Chapters IV., VII., XVIII., XIX., XX., XXIV., XXV.

Or,—"First Stage Steam," J. W. Hayward. (W. B. Clive, London.).

Price 2s. 6d.

Omit as much of pp. 4 and 5 as relates to "The Planimeter," together with § § 9, 18, 40, 60, 61, 62, 65, 77, 78, 81.].

#### vi.-Business Methods.

Office equipment.

General business terms and abbreviations.

Correspondence, care of; telegrams.

Postal regulations.

Business forms.

Banking: cheques, loans, overdrafts.

Railway rates, regulations and forms.

Purchase of materials-

Milk, valuation of.

Quotations for various goods required in a creamery.

Marketing of produce-

Market charges and regulations.

Trade routes.

Specal requirements of various markets.

Insurance—fire, boiler, and employer's liability.

Advertising—quotations and circulars.

Calculations-

Yield.

Cost at each stage of manufacture.

Monthly estimates.

Comparison of returns from milk, cream, butter and cheese trades.

Labour and wages.

#### Book-keeping-

Use and balancing various books used in creameries.

Preparation of returns.

Depreciation allowances.

Balance sheet.

Allocation of profits.

[" Modern Business Methods," Hooper and Graham. (Macmillan & Co.). Price 2s. 6d.

Omit pages 144 to 153, and Chapters XXVII. and XXVIII.

And,—" Practical Lessons in Bookkeeping," Jackson. (University Tutorial Press, Ltd.). Price 3s. 6d.].

Sale of Food and Drugs Acts, 1875 to 1899; the Fertilisers and Feeding Stuffs Act, 1893; the Employers' Liability Act, 1880; the Workmen's Compensation Act, 1900; the Factory and Workshop Act, 1901; Rivers Pollution Prevention Acts, 1876 and 1893; and so much of the Public Health (Ireland) Acts, 1878 to 1896, and the Friendly Societies Act, 1896, as may be applicable to creameries; the Dairies Cow-Sheds and Milk Shops (Ireland) Order of August, 1879, and subsequent Statutory Orders on this subject applying to Ireland.

#### 4. Surprise Butter Competitions.

A number of Surprise Butter Competitions will be held each year.

The object of these competitions is to induce creamery managers and others engaged in butter-making to give increased attention to every detail in the making and packing of butter, and particularly to cleanliness in every stage of the work. The reputation of Irish butter must depend on the degree in which these two essentials, viz., cleanliness and attention to details, are possessed by Irish buttermakers. But unless interest in the work can be increased and sustained, and unless those engaged in the industry bring into the work a certain amount of enthusiasm, accompanied by a desire and a determination to excel, the qualities which mark the successful buttermaker will not be perpetuated, and the possibilities of Ireland as a butter producer cannot be realised to the Fortunately, buttermaking is an occupation which becomes engrossingly interesting to those who have studied the numerous scientific problems which it presents to the thinking mind. courses of instruction for creamery managers have been instrumental in arousing interest in the scientific side of dairying, and it is hoped that these competitions may serve the further useful purpose of stimulating many creamery managers to greater sus-They certainly should set up a stantained practical efficiency. dard of comparison by means of which butter-makers will be able to measure their progress towards perfection.

The following is the procedure which the Department intend to adopt.

On not more than eight and not less than five occasions each year the Department will forward to each person who enters for the competitions a telegram requesting the recipient to send to an address in Dublin a box, keg, or kiel of butter made on the day the telegram is despatched, from cream separated on the previous working day. The butter at each competition may be judged one or more times by one or more competent and independent persons appointed by the Department.

Provided that the judges consider the exhibits show sufficient merit, the following prizes will be given in each competition on the basis of the highest total number of points, viz.:—

Prizes for first class, . . . £2 each
Prizes for second class, . . . £1 ,,

In addition a sum of 10s, will be awarded in each case to the dairymaid or actual maker of an exhibit obtaining a First Class prize.

Until further notice the following scale of points will be adopted as the basis in judging:—

Flavour,			•			<b>60</b> j	points.
Texture,						<b>2</b> 5	,,
Colour, .						5	,,
Packing an	d finis	sh,*	•	•	•	10	,,
	Tota	al,				100	,,

N.B.—To the total marks awarded to an exhibit two marks will be added if the exhibit contains no preservative other than salt. (See Condition 8 on page 512).

The following special prizes are offered in the case of exhibitors who comply with all the conditions of the competitions, and whose exhibits obtain not less than 90 per cent. of the maximum number of points obtainable during the year:—

To the manager of the creamery obtaining		
highest number of points,		£10
To the manager of the creamery obtaining	the	
second highest number of points,		${\mathfrak L}6$
To the manager of the creamery obtaining	the	
third highest number of points,		£4

In the event of two or more creameries obtaining the same total number of points during the year, or in any other circumstances which may arise, the Department reserve the right to allocate this sum of £20 in such manner as they may think fit.

All prizes will be paid at the end of the year.

<sup>\*</sup> See Condition 3, page 512.

#### Conditions of the Competitions.

- 1. These competitions are open to butter made in any creamery in Ireland, whether co-operative, joint stock, or private, which complies with the conditions of the competitions.
- 2. Applications must be made on Form A 136, which may be had from the Department, Upper Merrion-street, Dublin. The Forms, accurately filled in by intending competitors, who are required at the same time to enter their creameries for Registration, should be forwarded so as to reach the offices of the Department on or before the last day of March, 1906, accompanied by a fee of £1, which will admit to all the competitions in one year.

Creameries which have been placed on the Department's Register for 1905-6 are exempt from the payment of any fee for the competitions held in 1906.

3. The quantity of butter in each exhibit must be either 56 lbs., or 112 lbs., packed in a box, keg, or kiel, similar to those in regular use by the competitor.

Competitors using packages other than those in general use at their creameries will be disqualified from participating in any future competitions, and will forfeit any prizes that may have been awarded to their exhibits. They will also be debarred from entering their creameries for registration.

- 4. The butter must be made on the day on which the telegram is despatched by the Department, from cream separated on the preceding working day. The butter must be forwarded by passenger train, carriage paid, on the same day as that on which it is made.
- 5. Excepting the direction label supplied by the Department, there must be no mark or label in or on the package of butter, which might indicate its origin.
- 6. The carrying Company's receipt must be transmitted to the Department by post on the day the exhibit is forwarded. Unless the carrying Company's receipt is received at the office of the Department by the ordinary postal delivery on the morning of the day following that on which the telegram is despatched, the exhibit will be liable to be disqualified.
- 7. Butter containing more than 16 per cent. of water, or more than 3 per cent. of salt, will be ineligible for a prize.
- 8. To the total marks awarded by the Judges to an exhibit two marks will be added if the exhibit contains no preservative other than salt.
- 9. The butter sent in for competition will be paid for by the Department at the end of the year. The price given will be based on the current market rate prevailing for the various classes of butter at the date on which the telegrams are despatched, and shall be determined by the judges.

Any butter which reaches the Department in an unsatisfactory condition will not be paid for, but will be returned to the competitor at his own risk.

10. Creameries entered for the competitions must at all times

be open to the inspection of the Department's officers.

11. Any departure from these rules will disqualify the com-

petitor.

12. The Department may, without assigning any reason, refuse to accept for competition butter from any creamery, and in all cases of dispute the Department's decision shall be final.

Proposed Modifications in the Regulations of the Scheme for 1907-8.

While it is not intended to subject the main features of the Scheme to annual revision, alterations in matters of detail which from representations made to the Department, and from experience in the working of the Scheme, are found to be desirable, will be adopted in the Regulations which are published annually. The Department have under consideration the undermentioned modifications, which it is proposed to incorporate in the Regulations for next year (1907-8). As these changes will considerably alter the conditions under which creameries can be entered for Registration and for the Surprise Butter Competitions, it has been decided to afford this notification before their adoption is definitely sanctioned.

# Proposed Modifications.

- (1.) The existing condition No. (7) for Registration (see page 501 of Scheme) to be modified and to read as follows:—
  - (7.) That the 56-lb, pyramid boxes and the 112-lb, kiels used in the creamery are those approved by the Department as standard butter packages.
- (2.) The following to be added to the existing conditions for Registration as set forth on page of the Scheme:—
  - (10.) That, in the case of creameries having auxiliaries under their control, all the creamery's auxiliaries are entered for Registration.

    Under this arrangement applications from auxiliaries for Registration will not be entertained unless the "central' creameries with which they are connected are also entered for Registration, except in the case of independent separating stations not under the control of the churning stations which they supply with cream.
- (3.) The following to supersede existing Conditions 1 and 2 of the Surprise Butter Competitions (see page 512 of the Scheme):—
  - Only those creameries which are included in the Department's Register of Creameries for 1906-7 are eligible to participate in the Surprise Butter Competitions to be held in 1907.
- (4.) The following to supersede existing Condition 8 of the Surprise Butter Competitions:—
  - (8.) Butter containing any preservative other than salt will be disqualified.

2 n

COPIES OF FORMS OF CERTIFICATE AWARDED TO SUCCESSFUL CANDIDATES AT THE EXAMINATION FOR CREAMERY MANAGERS' CERTIFICATES IN 1905.

I.

#### CREAMERY MANAGER'S CERTIFICATE.

'(Cory.)

DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.
CREAMERY MANAGER'S CERTIFICATE.  Awarded
to————on the results of the Examination held in 1905, and in consideration of his having managed the————————————————————————————————————
This Certificate is renewable annually on the Conditions prescribed by the Department's Scheme for Improvement in the Management of Creameries.
[ Department's ] (Signed), T. P. GILL, Secretary

11.

#### PROVISIONAL CERTIFICATE.

(COPY.)

# DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

EXAMINATION FOR CREAMERY MANAGER'S CERTIFICATE.

#### PROVISIONAL CERTIFICATE.

This is to certify that———————————————————————————————————	oj, naving ocen
successful at the Examination held in 190	15, will be entitled to obtain the
Department's Creamery Manager's Certificate	upon showing that he has since
managed for at least one whole Season, to the	satisfaction of the Department, a
Creamery* registered under the Department's	Scheme for Improvement in the
Management of Creameries.	• •
•	T. P. GILL, Secretary.

Upper	Merrion	Street,	Du	blin	ι,
		190	)5.		
Erd				: •	

\* The term " Creamery" does not include auxiliaries where milk is separated and the cream sent elsewhere to be made into butter.

List of Technical Schools in which instruction is given in one or more of the subjects of Examination for the Department's Creamery Managers' Certificates.

The following list is published for the information of creamery students desiring to obtain Instruction in the subjects specified therein. It is, however, to be understood that the classes at the undermentioned schools are not framed to meet the requirements of creamery students in regard to the syllabus set forth in this pamphlet. At the same time the classes will in all cases be found useful for creamery managers.

NAME OF SCHOOL.	Subjects Taught.
Armagn Municipal Technical School,	Book-keeping.
BALLINASLOE: St. MICHAEL'S SCHOOL,	Business Methods, Office Routine, Book-
Ballsbridge, Dublin: Technical School.	keeping. Book-keeping.
BALLYMENA MUNICIPAL TECHNICAL SCHOOL	Theoretical Mechanics, Chemistry, Steam, Physiography.
BANBRIDGE TECHNICAL SCHOOL,	Chemistry, Physiography.
Bandon: Technical Classes,	Book-keeping.
BANGOR TECHNICAL SCHOOL,	Book-keeping, Physiography.
BELFAST MUNICIPAL TECHNICAL INSTITUTE.	Theoretical Mechanics, Practical Mechanics, Physics, Chemistry, Steam, Rook- keeping and Business Methods,
BLACKROCK, DUBLIN, TECHNICAL	Physiography.  Book-keeping, Chemistry, Physiography.
SCHOOL. BRAY TECHNICAL SCHOOL,	Book-keeping, Office work.
CARLOW TECHNICAL CLASSES (CHRISTIAN BROTHERS' SCHOOL).	Book-keeping.
CLONMEL TECHNICAL SCHOOL,	Book-keeping.
Coleraine Technical School,	Theoretical Mechanics, Physics, Chemistry
CORK: CRAWFORD MUNICIPAL TECH- NICAL INSTITUTE.	Book-keeping. Practical Mechanics, Chemistry, Steam, Agricultural Science.
Drogheda Municipal Technical Schools.	Book-keeping, Applied Mechanics, Physics, Chemistry.
Dundalk Municipal Technical Schools.	Book-keeping, Applied Mechanics, Theoretical Mechanics, Physics, Chemistry,
CITY OF DUBLIN TECHNICAL SCHOOL, .	Steam.   Book-keeping, Theoretical Mechanics, Applied Mechanics, Physics, Chemistry, Steam, Physicgraphy.
DUNGANNON TECHNICAL CLASSES, .	Theoretical Mechanics, Chemistry.
EGLINTON: CARMONEY NATIONAL	Agricultural Science.
SCHOOL. FERMOY TECHNICAL CLASSES,	Book-keeping, Business Methods.

NAME OF SCHOOL.	Subjects Taught.		
CITY OF GALWAY TECHNICAL INSTITUTE,	Book-keeping, Theoretical Mechanics,		
HOLLYWOOD TECHNICAL SCHOOL	Chemistry. Chemistry.		
KILKENNY TECHNICAL SCHOOLS, .	Book-keeping, Chemistry.		
Kingstown Municipal Technical Schools.	Book-keeping, Physics.		
Kinsale Technical Classes,	Book-keeping.		
Larne Technical School,	Physics, Chemistry, Book-keeping.		
LIMERICK MUNICIPAL SCIENCE AND ART AND TECHNICAL SCHOOLS.	Practical Mechanics, Chemistry, Steam.		
LONDONDRERY MUNICIPAL TECHNICAL SCHOOL.	Theoretical Mechanics, Practical Mechanics, Physics, Book-keeping, Physic-		
Lurgan Municipal Technical School,	graphy. Theoretical Mechanics, Book-keeping,		
MACROOM TECHNICAL CLASSES,	Physiography. Book-keeping.		
MALLOW TECHNICAL CLASSES,	Book-keeping.		
MIDLETON TECHNICAL CLASSES,	Book-keeping.		
NAAS TECHNICAL SCHOOL,	Book-keeping.		
NEWRY MUNICIPAL TECHNICAL SCHOOL,	Practical Mechanics, Chemistry, Book- keeping, Business Routine, Physio- graphy.		
NEWTOWNARDS MUNICIPAL TECHNICAL SCHOOL.	Practical Mechanics, Book-keeping.		
PORTADOWN TECHNICAL SCHOOL, .	Book-keeping.		
QUEENSTOWN TECHNICAL SCHOOL, .	Practical Mechanics, Steam.		
RATHMINES SCHOOL OF COMMERCE, .	Book-keeping, Business Methods.		
RINGSEND, DUBLIN, TECHNICAL SCHOOL	Book-keeping, Applied Mechanics.		
ROSCREA TECHNICAL SCHOOL,	Chemistry, Physiography.		
SLIGO MUNICIPAL TECHNICAL SCHOOL,	Book-keeping.		
THURLES TECHNICAL CLASSES (CHRISTIAN BROTHERS' SCHOOLS).	Experimental Science.		
TIPPERARY TECHNICAL CLASSES (CHRISTIAN BROTHERS' SCHOOLS).	Agricultural Science, Book-keeping.		
TRALEE CENTRAL TECHNICAL SCHOOL,	Practical Mechanics, Book-keeping.		
WARRENPOINT MUNICIPAL TECHNICAL SCHOOL.	Book-keeping, Business Routine.		
Waterford: Christian Brothers' Schools, Mount Sion.	Theoretical Mechanics, Chemistry.		
WATERFORD: DE LA SALLE TRAINING COLLEGE.	Chemistry, Physiography.		
WEXPORD MUNICIPAL TECHNICAL SCHOOL.	Book - keeping, Applied Mechanics, Chemistry.		

# 11.—List of Holders of the Department's Creamery Manager's Certificates, whose Certificates have been Renewed in 1906.

Name.	Creamery managed in 1905.	
Alcorn, Armer, .	Омаси Co-operative Agricultural and Dairy Society's (Ltd.) Creamery.	CERTIFICATE awarded in 1904, renewed in 1905, 1906.
HROARTY DENIS, .	BOHERBUE Creamery (Co-operative Wholesale Society, Ltd.)	CERTIFICATE awarded in 1905, renewed in 1906.
Lyon, James	BALLYRANHANE Co-operative Agricultural and Dairy Society's (Ltd.) Creamery.	CERTIFICATE awarded in 1904, renewed in 1905, 1906.
М'ОЕКМОТТ, ЈОНИ, .	DRUMQUIN Creamery,	CERTIFICATE awarded in 1904, renewed in 1905, 1906.
SEMPLE, EDWARD CHAS,	DONEGAL Co-operative Agricul- tural and Dairy Society's (Ltd.) Creamery.	CERTIFICATE awarded in 1905, renewed in 1906.
SPEARMAN, ANDREW H.,	KILLYMAN Co-operative Agricul- tural and Dairy Society's (Ltd.) Creamery.	CERTIFICATE moarded in 1904, renewed in 1905, 1906.
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# DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

#### 111.—REGISTER OF CREAMERIES AND AUXILIARIES—1905-6.

As a result of the inspection of creameries and auxiliaries from which applications were received in 1905 for Registration under the Department's scheme for improvement in the management of creameries, the following have been placed on the Department's Register for 1905-6.

#### Registered Creameries-1905-6.

Name and Postal Address of Creamery.	Name of Manager.	Name and Address of President, Chairman, or General Manager of the Society or Company to which Creamery belongs.
Ahington Creamery (Co-operative Wholesale Society, Ltd.), Bar- rington's Bridge, co. Limerick.	William Cusack, .	General Manager — W. I. Stokes, J.P., Mulgrave-street, Limerick.
AGHADOWEY Co-operative Agricultural and Dairy Society's (Ltd.) Creamery, Drumcroon, Coleraine, co. Londonderry.	Daniel Sheehan, .	President—H. S. Morrison, M.D., Belview, Blackhill, Coleraine.
Anglo-Irish Condensed Milk Company's (Ltd.) Creamery, Midleton, co. Cork.	R. H. WILKINSON, .	Chairmun-W. G. WATSON, The Grange, Harold Wood, Essex.
ARDAGH Co-operative Dairy Society's (Ltd.) Creamery, Ardagh, co. Limerick.	John Shekhan,	President — MICHAEL ENRIGHT, Kilreash, Ardagh.
Bailieboro' Co-operative Agricultural and Dairy Society's (Ltd.) Creamery, Bailieboro', co. Cavan.	Patrick M'Carthy, .	President — THOMAS MICHAEL FARRELLY, Main-street, Baile- boro', co. Cavan.
BALLYBRICKEN Creamery (Cooperative Wholesale Society, Ltd.), Ballybricken, Caherelly, Kilmallock.	W. P. CLIFFORD, .	General Manager—W. L. STOKES, J.P., Mulgrave-street, Limerick.

Name and Postal Address of Creamery.	Name of Manager.	Name and Address of President, Chairman, or General Manager of the Society or Company to which Creamery belongs.
BALLYCANEW Co-operative Agricultural and Dairy Society's (Ltd.) Creamery, Ballycanew, Gorey, co. Wexford.	EDMOND L. KEATING, .	President—C. M. DOYNE, D.L., Wells, Gorey.
BALLYMOTE Co-operative Agricul- tural and Dairy Society's (Ltd.) Creamery, Ballymote, co. Sligo.	THOMAS DE LACY,	President — Very Rev. CANON LOFTUS, P.P., The Presbytery, Ballymote.
BALLYRASHANK Co - operative Agricultural and Dairy Society's (Ltd.) Creamery, Ballyrashane, Coleraine.	JAMES LYON,	President — JAMES STEWART MOORE, D.L., Ballydivity, Dervock, co. Antrim.
Belleek Co-operative Agricul- tural and Dairy Society's (Ltd.) Creamery, Belleek, co. Fer- managh.	DANIEL J. M'SWEENEY.	President—CHARLES J. TREDEN- NICK, Fortwilliam, Belleck, co. Fermanagh.
Boherbue Creamery (Co-operative Wholesale Society, Ltd.), Boherbue, Banteer, co. Cork.	DENIS HEGARTY,	General Manager—J. TURNBULL, 20, John-street, Cork.
Brosna Co-operative Agricultural and Dairy Society's (Ltd.) Creamery, Brosna, co. Kerry.	JOHN O'CONNELL, .	President - Rev. J. J. O'SULLIVAN, o.c., Brosna, co. Kerry.
Bunkay Bridge Creamery (Cooperative Wholesale Society, Ltd.), Castleconnell, co. Limerick.	Hugh M'Cullough, .	General Manager - W. L. STOKES, J.P., Mulgrave-street, Limerick.
CASTLECAULFIELD Co-operative Agricultural and Dairy Society's (Ltd.), Creamery, Castlecaul- field, co. Tyrone.	WILLIAM BLAIR,	President—C. W. NASH, Pookonour, Castlecaulfield.
CASTILEOR Dairy Company's (Ltd.) Creamery, Castlecor, Kanturk, co. Cork.	Cornelius Kiely, .	Chairman—W. N. BARRY, J.P., Castlecor House, Castlecor.
CENTENARY Co-operative Creamery Company's (Ltd.) Creamery, Ballyduff, Thurles, co. Tipperary.	Richard Walsh, .	Chairman—Rev. RIGHARD FEN- NELLY, Castletown, Moyne, Templemore, co. Tipperary.
CLONES Co-operative Agricultural and Dairy Society's (Ltd.) Creamery, Clones, co. Monaghan.	ALEX. B. HENRY, .	President—JAMES WEST, J.P., Scotsboro' House, Clones.
COAGH Co-operative Agricultural and Dairy Society's (Ltd.) Creamery, Coagh, co. Tyrone.	James M'Laughlin, .	President — ROBERT BURGESS, 1. R.C.V. & S. (Edin.), Coagh.
CUTTEEN Creamery (Co-operative Wholesale Society, Ltd.), Cut- teen, Tipperary.	D. K. NOONAN,	General Manager—W. L. STOKES, J.P., Mulgrave-street, Limerick.
DERRYGONNELLY Co - operative Dairy Society's (Ltd.) Creamery, Derrygonnelly co. Fermanagh.	Wm. M'Loughlin,	President—Rev. P. HACKETT, C.C., Derrygonnelly.

Name and Postal Address of Creamery.	Name of Manager.	Name and Address of President, Chairman, or General Manager of the Society or Company to which Creamery belongs.
DONEGAL Co-operative Agricul- tural and Dairy Society's (Ltd.) Creamery, Donegal.	Edward C. Semple, .	President—H. D. WARNOCK, M.D., F.R C.S., Invereske, Donegal.
DROMCLOUGH Creamery (Co-operative Wholesale Society, Ltd.), Listowel, co. Kerry.	WALTER E. LESLIE, .	General Manager—W. L. STOKES, J.P., Mulgrave-street, Limerick.
DROMORE Co-operative Agricul- tural and Dairy Society's (Ltd.) Creamery, Dromore, co. Tyrone.	JAMES J. HURLEY, .	President — JAMES WALLACE, Aughadarra, Dromore, Tyrone.
DRUMQUIN Creamery, Drumquin, co. Tyrone.	John M'Dermott, .	Proprietary Creamery belonging to Rev. T. L. F. STACK, B.D., Lower Langford Rectory, Drum-
FINN VALLEY Co-operative Agri- cultural and Dairy Society's (Ltd.) Creamery, Crossroads, Killygordon, co. Donegal.	Christopher B. Duffy,	quin, co. Tyrone.  President.—Capt. John Riky, J.r.,  Mount Hall, Killygordon.
FIVEMILETOWN AND BROOKE- BOROUGH Co-operative Agricul- tural and Dairy Society's (Ltd.) Creamery, Fivemiletown, co. Tyrone.	PETER BENNOCH, .	President—H. DE F. MONTGOMERY, D.L., Blessingbourne, Fivemiletown.
FREEMOUNT Dairy Company's (Ltd.) Creamery, Freemount, Charleville, co. Cork.	Timothy O'Callaghan,	Chairman. JOHN MORTON, Lyre, Freemount, Charleville.
GLENWILLIAM Co-operative Dairy Society's (Ltd.) Creamery, Ballingarry, co. Limerick.	TIMOTHY MULLINS, .	President—T. D. ATKINSON, D.L., Glenwilliam Castle, Ballingarry, co. Limerick.
GRANAGH Co-operative Dairy Society's (Ltd.) Creamery, Bal- lingarry, co. Limerick.	RICHARD CHAWKE, .	President — DANIEL HEDERMAN, Ballyneale, Ballingarry, co. Limerick.
GRANARD Co-operative Dairy Society's (Ltd.) Creamery, Granard, co. Longford.	John Cawley,	President—Ven.Archdeacon Sмітн, г.г., The Parochial House, Granard.
GRANTSTOWN Creamery (Co- operative Wholesale Society, Ltd.), Grantstown, Tipperary.	JOHN O'DWYER,	General Manager—W. L. STOKES, J.P., Mulgrave-street, Limerick.
GREYBRIDGE Ureamery (Cooperative Wholesale Society, Ltd.), Meanus, Kilmallock, co. Limerick.	Michael Power, .	General Manager—W. L. STOKES, J.P., Mulgrave-street, Limerick.
INVER Co-operative Agricultural and Dairy Society's (Ltd.) Creamery, Inver, co. Donegal.	PATRICK COLEMAN, .	President—Very Rev. E. MAGUIRE, D.D., Inver.
Invinestown Co-operative Agri- cultural and Dairy Society's (Ltd.) Creamery, Irvinestown, co. Fermanagh.	WM. R. IRWIN,	President — EDWARD ARCHDALE, D.L., Castle Archdale, Irvines- town.

Name and Postal Address of Creamery.	Name of Manager.	Name and Address of President, Chairman, or General Manager of the Society or Company to which Creamery belongs.
KILCOMMON Creamery (Co-oper- ative Wholesale Society, Ltd.), Kilcommon, Thurles, co. Tip- perary.	JAMES C. DOHERTY, .	General Manager-W. L. STOKES, J.P Mulgrave-street, Limerick.
KILPINANE Co-operative Agricul- tural and Dairy Society's (Ltd.) Creamery, Kilfinane, co. Limerick.	JOHN C. TURNER, .	President—MAURICE CONNERY, J.P., Co.C., Spring Lodge, Kiltinane.
KILLASNETT Co-operative Agricul- tural and Dairy Society's (Ltd.) Creamery, Lurgauboy, Manor- hamilton, co. Leitrim.	EDWARD O'CALLAGHAN,	President—Rev. S. M'TERNAN, P.P., M.R.I.A, Manorhamilton.
KILLEN Co-operative Agricultural and Dairy Society's (Ltd.) Creamery, Killen, Castlederg, co. Tyrone.	Wм. J. Brggs,	President—John Rutledge, Ardbarron, Castlederg.
KILLYMAN Co-operative Agricul- tural and Dairy Society's (Ltd.) Creamery, Moy, co. Tyrone.	A. H. Spearman, .	President — HENRY ATKINSON. Brookfield, Dunganuon.
KILNALECK Co-operative Agricul- tural and Dairy Society's (Ltd.) Creamery, Kilnaleck, co. Cavan.	CHAS. E. COSTELLO, .	President—E. MOTHERWELL, J.P. Foxfield House, Kilnaleck.
KILTOGHERT Co-operative Agri- cultural and Dairy Society's (Ltd.) Creamery, Kiltoghert, Carrick-on-Shannon, co. Leitrim.	MARTIN BEIRNE,	President—Rev. M. NANGLE, C.C. Drumliffon, Kilclare.
KINAWLEY Co-operative Agricul- tural and Dairy Society's (Ltd.) Creamery, Kinawley, Belturbet, co. Fermanagh.	JOHN FENNESSY, .	President—Rev. Thos. Torrens M.A., Kinawley.
KINLOUGH Co-operative Agricul- tural and Dairy Society's (Ltd.) Creamery, Kinlough, co. Leitrim,	DANIEL J. CROWLEY, .	President—St. Geo. R. Johnston J.P., Mountprospect, Buckode Kinlough.
KNOCKAVARDAGH AND MOYGLASS, (co. Tipperary), Co-operative Creamery and Butter Factory Company's (Ltd.) Creamery, Killenaule, Thurles.	RICHARD MURPHY, .	Chairman—Rev. RICHARD FEN NELLY, Castletown, Moyne, Tem plemore.
l. AGAN Co-operative Agricultural and Dairy Society's (Ltd.) Creamery, Sallybrook, Manor- cunningham, co. Donegal.	W. S. Russell, , .	President—Samuel Marshall J.P., Sallybrook, Manoreunning ham.
LECKPATRICK Co-operative Agri- cultural and Dairy Society's (Ltd.) Creamery, Artigatvan, Strabane, co. Tyrone.	THOS. H. QUINN,	President—J. C. BOYD, M.B., Lif ford, Strabane.
LIMAVADY Co-operative Agricul- tural and Dairy Society's (Ltd.) Creamery, Limavady, co. Lon- donderry.	Wm. Ashcroft,	President—S. M. MACRORY, J.P. Co.C., Ardmore and Newto Mills, Limavady.

Name and Postal Address of Creamery.	Name of Manager.	Name and Address of President, Chairman, or General Manager of the Society or Company to which Creamery belongs.
LISBELLAW Co-operative Agricultural and Dairy Society's (Ltd.) Creamery, Lisbellaw, co. Fermanagh.	TIMOTHY NOONAN	President—E. MITCHELL, Derryvullen, Enniskillen.
LISCARROLL Co-operative Dairy Society's (Ltd.) Creamery, Lis- carroll, Buttevant, co. Cork.	Samuel Lombard,	President—Rev. P. M'SWEENEY, P.P., Churchtown, co. Cork.
LIXNAW Creamery (Co-operative Wholesale Society, Ltd.), Lix- naw, co. Kerry.	JOHN O'LEARY,	General Manager - W. 1. STOKES, J.P., Mulgrave-street, Limerick.
LOUGHBRICKLAND Co-operative Agricultural and Dairy Society's (Ltd.) Creamery, Loughbrick- land, co, Down.	Robert Нуре,	President—Rev. J. B. Lusk, The Manse, Glasker, Loughbrickland.
MONEYMORE Co-operative Agricultural and Dairy Society's (Ltd.) Creamery, Moneymore, co. Londonderry.	THOMAS SCOTT,	President — HENRY BYRNE, Moneymore, co. Londonderry.
NEWMARKET Creamery (Newmarket Dairy Co., Ltd.), Newmarket, co. Cork.	THOMAS HURLEY, .	Managing Director—P. O'SHAUGH- NESSY, Riversdale, Coachford, co. Cork.
Omagh Co-operative Agricultural and Dairy Society's (Ltd.) Creamery, Omagh, co. Tyrone.	ARMER ALCORN,	President—John G. R. Porter, J.P., Park-avenue, Omagh.
Pomenoy Co-operative Agricul- tural and Dairy Society's (Ltd.) Creamery, Pomeroy, co. Tyrone.	JAMES GRANT,	President—Col. R. T. G. Lowry, D.L., Pomeroy House, Pomeroy.
PORTGLENONE Co-operative Agricultural and Dairy Society's (Ltd.) Creamery, Portglenone, co. Antrim.	WILLIAM WHARTON, .	President—J. B. STEWART, M.D., Portglenone, co. Antrim.
RAMELTON Co-operative Agricul- tural and Dairy Society's (Ltd.) Creamery, Ramelton, co. Donegal.	JAMES J. KELLY,	President—S. DAVIDSON D.C., Ardnarn, Ramelton, co. Donegal.
RATHRENNY Co-operative Agricul- tural and Dairy Society's (Ltd.) Creamery, Rathkenny, Carn- coagh, co. Antrim.	James Greer,	President—John M'Cay, M.D., Clough, Belfast.
Scottish Co-operative Wholesale Society's (Ltd.) Creamery, Ennis- killen, co. Fermanagh.	OWEN CORRIGAN, .	General Manager—W. R. WHYTE, Thistle Bank House, Enniskillen.
Shanehagh Co-operative Agricultural and Dairy Society's (Ltd.) Creamery, Shaneragh, Dromore, co. Tyrone.	DENIS J. COSTELLOE, .	President—Rev. WALTER Scott, Brookfield, Clanabogan, Omagh.
SMERLA BRIDGE Creamery (Co- operative Wholesale Society, Ltd.), Smerla Bridge, Listowel, co. Kerry.	WALTER E. LESLIE, .	General Manager—W. L. STORES, J.P., Mulgrave-street, Limerick.

Name and Postal Address of Creamery.	Name of Manager.	Name and Address of President, Chairman, or General Manager of the Society or Company to which Creamery belongs.			
SOLOHEAD Co-operative Agricultural and Dairy Society's (Ltd.) Creamery, Limerick Junction, co. Tipperary.	J. J. O'Hra,	PresidentRev.THOMAS O'DWYER, P.P., The Presbytery, Solohead, Limerick Junction.			
SPAMOUNT Co-operative Agricul- tural and Dairy Society's (Ltd.) Creamery, Spamount, Castle- derg, co. Tyrone.	DAVID HICKEY,	President—Rev. A. LEITCH, Drum- clamph Rectory, Castlederg, co. Tyrone.			
Springfield Co-operative Agri- cultural and Dairy Society's (Ltd.) Creamery, Enniskillen, co. Fermanagh.	ROBERT G. MARSHALL.	President—C. BRACKEN, The Graan, Enniskillen.			
Tassagn Co-operative Agricul- tural and Dairy Society's (Ltd.) Creamery, Tassagh, Armagh.	Thos. M'Cluskey, .	President Rev. PATRICK A. MACKIN, C.C., Granemore, Tass- ngh, Armagh.			
Unney Co-operative Agricultural and Dairy Society's (Ltd.) Creamery, Urney, co. Tyrone.	JOHN J. GALLEN, .	President — JOHN O'FLAHERTY, J.P., The Grove, Urney, co. Tyrone.			

# REGISTERED AUXILIARIES, 1905-6.

Name and Postal Address of Auxiliary.	Name of Manager.	Name and address of President, Chairman, or General Manager of the Society or Company to which Auxiliary belongs.
BELNALECK Auxiliary (Scottish Co-operative Wholesale Society, Ltd.), Belnaleck, Enniskillen.	GLOVER ABERCROMBIE,	General Manager-W. R. WHYTE, Thistle Bank House, Enniskillen.
Blackilon Auxiliary (Scottish Co-operative Wholesale Society, Ltd.), Blacklion, co. Cavan.	JAMES MURPHY,	General Manager-W. R. WHYTE, Thistle Bank House, Enniskillen
BRAID Co-operative Agricultural and Dairy Society's (Ltd.) Auxiliary, Broughshane, co. Antrim.	WILLIAM J. GASTON, .	President — Rev. ALEX. SLOAN, The Manse, Buckna, Brough- shane.
CARNDONAGH Co-operative Agricultural and Dairy Society's (Ltd.) Auxiliary, Carndonagh, co. Donegal.	W. E. Knox,	President—Rev. JOHN DOHERTY, Adm., Churchtown, Carndonagh.
COPANN Co-operative Dairy Society's (Ltd.) Auxiliary, Laghey, co. Donegal.	H. Collum,	President—J. V. Collins, L.R.C s.1 L.K. Q.C.P.I., Laghey, co. Donegal

Name and Postal Address of Auxiliary.	Name of Manager.	Name and Address of President, Chairman, or General Manager of the Society or Company to which Auxiliary belongs.			
CREEVELEA Co-operative Auxiliary, Creevelea, Drumkeeran.	W. Gaffney,	President-Rev. J. MEEHAN, C.C., Creevelea, Drumkeeran.			
Donations Co-operative Agricul- tural and Dairy Society's (Ltd.) Auxiliary, Bready, Strabane.	J. GRAHAM,	President—Rev. J. CONNELL, H.A., Manse, Bready, Strabane.			
FIVEMILETOWN AND BROOKE-BOROUGH Co-operative Agricultural and Dairy Society's (Ltd.) Anxiliary, Brookeborough.	Т. Тномгооч,	President—II. de F. MONTGOMERY, D.L., Blessingbourne, Fivemile- town.			
FLORENCE COURT Auxiliary (Scottish Co-operative Wholesale Society, Ltd.), Florence court, Enniskillen.	A. ABERCROMBIE, .	General Munager-W. R. WHYTE, Thistle Bank House, Enniskillen.			
GARDINER'S CROSS Auxiliary (Scottish Co-operative Whole- sale Society, Ltd.), Cornafanog, Lisbellaw.	W. Ross Magre, .	General Monager-W. R. WHYTE, Thistle Bank House, Enniskillen.			
GLENFARNE Auxiliary (Scottish Co-operative Wholesale Society, Ltd.), Glenfarne, co. Leitrim.	DENIS SHEEHAN,	General Manager—W. R. WHYTE, Thistle Bank House, Enniskillen.			
GLENFINN Co-operative Agricul- tural and Dairy Society's (Ltd.) Auxiliary, Welshtown, cc. Done- gal.	E. J. Scanlon,	President—WM. H. H. DONALD- SON, J.P., Glenafton, Welshtown, co. Donegal.			
Gola Auxiliary (Scottish Co- operative Wholesale Society, Ltd.), Lisbellaw, co. Fermanagh.	Patrick O'Sullivan, .	General Manayer - W. R. WHYTE, Thistle Bank House, Enniskillen.			
KILVILCARRIS Co-operative Agricultural and Dairy Society's (Ltd.) Auxiliary, Drom, Templemore, co. Tipperary.	M. Cass,	President BROOKLYN ROE, Graigue Bush, Templemore.			
PALLAS Co-operative Agricultural and Dairy Society's (Ltd.) Auxi- liary, Pallas, Kilanerin, Gorcy.	P. Sullivan,	President—THOS. WEBSTER, Great Grove, Hollyfort, Gorey.			
"S" BRIDGE Auxiliary (Scottish Co-operative Wholesale Society, Ltd.), Tempo, co. Fermanagh.	ARTHUR FEE,	General Manager — W. R. WHYTE, Thistle Bank House, Enniskillen.			

#### II.—TECHNICAL INSTRUCTION.

Form S 41.

DEPARTMENT OF AGRICULTURE AND
TECHNICAL INSTRUCTION FOR IRELAND,
UPPER MERRION-STREET, DUBLIN.

# SUMMER COURSES OF INSTRUCTION FOR TEACHERS, 1906.

The Department will, during the summer, conduct short courses of instruction for teachers as under:—

- A.—Courses beginning Tuesday, 10th July, and closing Friday, 3rd August:—
  - (1) Courses in Experimental Science, in Laboratory Arts, and in Drawing and Modelling, for teachers in Day Secondary Schools and in Day and Evening Science and Art Classes.
  - (2) Courses in Domestic Economy and in Manual Training (Woodwork) for Teachers of those subjects in Day Secondary Schools.
  - (3) A course of instruction for teachers of Lace and Crochet Making, Sprigging, and Drawn Thread-work.
- B.—Courses beginning Tuesday, 7th August, and closing Friday, 31st August:—
  - (4) Courses for Manual Instructors, in Woodcarving, Modelling and Turnery, and in Carpentry and Joinery (Honours Grade).

The courses will be held in Dublin, Belfast, and Cork, but the centres will not be arranged until all applications have been received and considered.

Should the applications exceed the number for which it is proposed to provide accommodation, those applicants will be selected whose admission would appear most likely to prove beneficial. Applications from teachers who have attended short courses of instruction in previous years, and who have been giving instruction in the subjects of those courses during the present session, will have priority of claim for admission to advanced courses.

It is important that teachers should not apply unless they know that they will be able to attend, for great difficulties, as well as injustice to others, may be entailed by applicants failing to take advantage of admission which may be granted. Failure to attend the course after the invitation has been accepted, will, except in the case of illness, be regarded as an abuse of the privilege; and any teacher failing in this respect will be debarred from attending any future course.

Teachers who are selected for, and who attend the courses of instruction regularly and punctually at the specified hours, from the beginning to the end of the course, will be allowed a sum of £3 10s. towards their expenses while living at the centre; and those who travel more than twenty miles to the centre of instruction will be allowed, in addition, Third Class Railway Fare for one journey to and fro between the railway station nearest their school and Dublin, Belfast, or Cork, as the case may be; no car fares, or other travelling expenses will, however, be allowed. These allowances will in no case be made until after the conclusion of the courses.

The hours of attendance will be from 10 a.m. to 4 p.m. daily (with an interval of one hour for lunch), except on Saturdays, when the hours will be from 10 a.m. to 1 p.m. In addition, teachers will be required in the evenings to write out notes, &c.

Teachers desiring to take advantage of these courses must fill up and return the appropriate form of application (see below) as early as convenient, but in any case so as to reach the offices of the Department not later than the **31st March**.

N.B.—These courses are open only to teachers who are over eighteen years of age, and who are engaged (a) by Local Committees of Technical Instruction; or (b) in schools receiving grants either directly from the Department or under the provisions of an approved local scheme of Technical Instruction.

#### DETAILS OF THE COURSES.

I. (a.)—Experimental Science.

There may be thirteen courses of instruction in Experimental Science.

Subjects:—First and Second Years of the Preliminary Course;
Third and Fourth Year Courses in Physics,
Chemistry, Mechanical Science, Botany, and Physiology and Hygiene, and a course in Geology.

These courses will not only cover the subject-matter of the syllabuses of the Department's programme for Day Secondary Schools; but will aim directly at bringing home to teachers the intentions of the Department as expressed in the prefatory note thereto.

Provisional recognition to teach the subject of the course will be accorded to those teachers who have punctually and regularly attended, and successfully done the class work, as testified by laboratory note books, and by any examination—written, viva voce, or practical—which it may be desirable to hold.

Application for admission to these courses must be made on Form S 42.

(Note.—In 1907 the Department will not arrange for a Summer Course in the First Year Syllabus of the Preliminary Course, and in 1908 a Course in the Second Year Syllabus will not be conducted. Courses in these subjects will in future be conducted in alternate years.)

#### I. (b.)—Laboratory Arts.

This course of instruction will be designed specially for those teachers who have already successfully attended four Summer Courses in Experimental Science, and is intended to give them special practice in the construction, adjustment, and repair of laboratory apparatus of a simple character, and to demonstrate how the equipment of a laboratory may be most suitably used and extended.

The course will include practice in glass blowing and bending, soldering, the use of common tools for wood and metal work, and instruction in the properties of common materials for instrument making, so that teachers may be able to design and make for themselves laboratory apparatus of a character suited to their work.

Teachers who have punctually and regularly attended, and in respect of whom the Department receive satisfactory reports, will receive a certificate of satisfactory attendance. Satisfactory attendance at the course in Laboratory Arts will be accepted in lieu of attendance at a fifth Summer Course under the conditions of Section I. (2) of Circular 23.

Application for admission to this Course must be made on Form S 42.

#### I. (c.)—Drawing and Modelling.

The course of instruction in Drawing and Modelling will be specially devoted to enabling teachers to secure the Irish Secondary Teachers' Drawing Certificate (see Circular Letter No. 16); but instruction of a more advanced character will be afforded to those teachers who are already qualified for this certificate, or who hold higher certificates.

Teachers must not regard attendance at these courses as sufficient qualification to give instruction in the Department's Programme of Drawing. They should continue their studies throughout the winter, and present themselves for examination in the subjects required for the Irish Secondary Teachers' Drawing Certificate, at the annual examinations of the Board of Education, South Kensington, held in April, May, and June. The Regulations for the admission of external candidates to these examinations are given in Form S 100, copies of which may be obtained on application.

Application for admission to this Course must be made on Form S 42.

# II. (a.)—Domestic Economy.

In order to facilitate the introduction of this subject into the curriculum of Day Secondary Schools, the Department propose to arrange for summer courses of instruction in Domestic Economy for teachers who have already obtained provisional recognition to give instruction in the First and Second Year Syllabuses of the Preliminary Course of Experimental Science. The course of instruction will include Cookery, the elements of Physiology and Hygiene, and Needlework.

Recognition to teach Domestic Economy in Day Secondary Schools during the Session 1906-7 will be given to those teachers who have punctually and regularly attended, and successfully done the class work, as testified by note books and by any examination—written, viva voce, or practical—which it may be desirable to hold. Teachers who successfully attend three Summer Courses in Domestic Economy, under the conditions referred to above, and who teach this subject for two complete sessions to the satisfaction of the Department's Inspectors, will be recognised as qualified to give instruction, in Day Secondary Schools, in the Preliminary Course of the Department's Programme of Experimental Science and in the Syllabuses of Domestic Economy. (See Circular 25).

Application for admission to this Course must be made on Form S 42.

## II. (b.)—Manual Instruction (Woodwork).

The course of Manual Work will include instruction in Drawing, in addition to practical instruction in the use of Woodworking tools, and will provide for the further training of teachers who at present teach these subjects in Day Secondary Schools, or who will be engaged as instructors during the forthcoming session. Examinations will be held at the conclusion of the course, and teachers who succeed in passing these examinations will, for the present, be accepted as qualified to give instruction in the subject under the Department's Regulations for Day Secondary Schools, subject to the conditions of Circular 24.

Application for admission to this course must be made on Form S 42.

III.—Course of Instruction for Teachers of Lace and Crochetmaking, Sprigging, and Drawn Thread-work.

The object of the present course is to improve existing kinds of work, and not to introduce new forms. The instruction will be confined to—

- A. Limerick Lace.
- B. Clones Crochet.
- C. Raised Crochet.
- D. Sprigging and Drawn Thread Work.

The lessons on each of these subjects will include instruction in technique and the use of suitable materials; Drawing, the preparation of working tracings, and of working drawings from rubbings of lace and crochet. In the case of those capable of profiting by such form of instruction, practice in Design will also be afforded. Special instruction will be given in the artistic arrangement of traditional details ordinarily used by crochet workers. Exercises will be given in which the actual units will be employed, and drawings will be made from such arrangements as prove satisfactory.

Certificates of proficiency will be awarded at the close of the course to those who have attended regularly and worked well, and whose work is of a sufficiently high standard, as shown by the

specimens produced during the class-lessons, and by any tests of a written or practical character which it may be considered advisable to apply.

Teachers attending this course will be required to bring their usual working material with them, as well as pencils, india-rubber, compasses, a twelve-inch ruler, two set squares (one of 45° and the other of 60°), and a medium-sized drawing book. Teachers of 'crochet making should also provide themselves with sets of such details as they are accustomed to work for the trade, as for example, the "Scroll," "Lily," "Hawthorn," "Shamrock," "Stein," "Branch," rosettes of various forms, &c.

Application for admission to this course must be made on Form S 140.

IV.—Wood-carving, Modelling and Turnery, and Carpentry and Joinery (Honours Grade).

These courses are intended primarily for the further training of Manual Instructors who are at present under engagement to Local Committees of Technical Instruction. A certificate of satisfactory attendance and progress will be issued to those who are favourably reported upon by the Instructors in charge; but it is not the intention of the Department to issue Teachers' Certificates upon the results of the courses.

Application for admission to this course must be made on Form S 42.

Circular 40.

DEPARTMENT OF AGRICULTURE AND
TECHNICAL INSTRUCTION FOR IRELAND,
UPPER MERRION STREET,
Dublin, March, 1906.

EXHIBITION OF MANUAL WORK, CARPENTRY AND JOINERY, &c., 1906.

SIR,

The Department propose to hold, in August, 1906, an exhibition of Manual Work (in Wood and Metal), Carpentry and Joinery, Cabinet Making, Woodcarving, and Building Construction drawings, to be representative of the work done in Day Primary and Secondary Schools, in Technical Institutes, and during courses of instruction in rural centres, and they request the kind assistance and co-operation of Committees, of School Managers, and of Teachers, in making the exhibition successful.

The exhibition will be held in Dublin, and it is hoped that those attending the Summer Courses of Instruction to Teachers, in Dublin, as well as the general public, will thus be enabled to visit it.

Attention is directed to the rules in the Appendix to this communication, the careful observance of which is necessary in order to secure a uniform series of exhibits. Failure to observe these rules may necessitate the refusal of works submitted.

I am, Sir,

Your obedient Servant,

T. P. GILL.

Secretary.

#### APPENDIX.

#### DAY PRIMARY AND SECONDARY SCHOOLS.

Manual Work in Wood and Metal.

1. Three exhibits, each consisting of the complete session's practical work of one pupil with its accompanying drawings, may be submitted in respect of each year of the course followed at any school.

#### TECHNICAL SCHOOLS AND CLASSES.

Manual Work in Wood and Metal, Carpentry and Joinery, Cabinet Making, Woodcarving, and Building Construction.

2. Exhibits should be such as to give a general idea of the work done by the classes, and especially of any branch of work to which particular attention is paid. The exhibits—other than Building Construction drawings—must not require more space than 60 square feet, nor those from a class conducted in a rural centre more than 50 square feet.

3. All Building Construction drawings must be mounted on sheets of brown paper 32 inches by 24 inches, which will be supplied to schools and classes by the Department. Drawings which are not thus mounted cannot be exhibited; drawings may, however, be submitted which occupy a single sheet larger than that specified.

4. The drawings should be selected to illustrate as far as possible the courses of instruction followed during the year.

5. In mounting, the drawings in different subjects, and for different years or stages, should be kept separate.

#### GENERAL.

6. Each exhibit must bear a label, copies of which will be supplied by the Department, showing clearly the name and age of the student, and the year or stage of the course of instruction followed.

Each example of work submitted must be entirely the work of that student during the session 1905-6.

7. Applications for sheets of brown paper and labels must be made on Form S 128 not later than May 31st, 1906. The supply will be forwarded to the schools early in July. Copies of the form referred to may be obtained after the 1st April, 1906.

8. All exhibits must be forwarded to reach the offices of the

Department not later than the 25th July.

9. The Department will pay carriage each way upon exhibits submitted, if they do not exceed the limits mentioned above.

#### III.—VETERINARY.

# CIRCULAR TO LOCAL AUTHORITIES UNDER THE DISEASES OF ANIMALS ACTS.

DEPARTMENT OF AGRICULTURE AND
TECHNICAL INSTRUCTION FOR IRELAND,
UPPER MERRION STREET,
DUBLIN, March, 1906.

No. 1342-06. (Veterinary Branch).

#### SHEEP DIPPING.

SIR,

The Department of Agriculture and Technical Instruction for Ireland desire again to draw the attention of the Local Authorities under the Diseases of Animals Acts in the various counties in Ireland to the subject of Sheep Dipping.

In an earlier Circular, No. 1670/05, issued this time last year, the Department took occasion to point out specially the scope of the new powers with which Local Authorities had been vested in pursuance of the Diseases of Animals Act, 1903, as regards both—

- (a.) The making of regulations for securing the periodic dipping of sheep; and
- (b.) The provision of facilities to enable sheep owners to carry out dipping.

During the interval that has since elapsed nothing has occurred to indicate any general disposition on the part of the Local Authorities to exercise these powers. In some few instances, it is true, the matter is known to be at present under the consideration of the Local Authority; but, so far, there is no county in which compulsory dipping regulations are in operation, or in which any extended provision of dipping facilities has been made by the Local Authority.

# APPENDIX I.

# SHEEP SCAB IN IRELAND.

RETURN showing the number of Outbreaks of Sheep Scab which occurred during each of the undermentioned years.

	<del>y</del>	YEARS.						
Countie	cs.	1900.	1901.	1902.	1903.	1904.	1905.	1906. (From 1st Jan. to 3rd March.)
ULSTER:								
Antrim,		5	4	7	2	3	1	1
Armagh,		5	9	-	6	2	1	1
Cavan,		1	6	2	9	1	3	2
Donegal,		13	6	4	54	29	9	-
Down,		33	25	18	30	24	36	2
Fermanagh,		9	-	9	1	2	2	-
Londonderry,		5	-	5	5	3	3	1
Monaghan,		1	-	2	3	1	-	1
Tyrone,		4	4	3	2	4	2	6
MUNSIER:								
Ol <b>a</b> re,		14	6	5	3	1	2	_
Cork,		72	95	105	98	68	35	19
Ker <b>ry</b> ,		32	20	35	20	22	4	8
Limerick,		28	22	20	22	30	2	_
Tipperary (N.H	ł.),	3	8	4	3	5	4	_
Tipperary (S.F.	R.),	11	16	3	11	12	13	_
Waterford,		16	12	28	5	14	45	3
LEINSTER:								
Carlow,		16	14	19	15	21	9	1
Dublin,		42	35	43	40	30	7	10
Kildare,		50	28	47	43	27	15	4
Kilkenny,		7	8	9	18	11	6	1
King's County,		7	15	13	11	6	6	5
Longford,		3	3	6	2	7	_	_
Louth,		2	1	5	_		_	1
Meath,		21	22	26	21	14	9	8
Queen's County	/,	12	13	5	11	2	6	1
Westmeath,		30	25	19	25	15	15	i
Wexford,		48	55	36	42	22	28	10
Wicklow,		22	26	48	59	20	14	15
CONNAUGHT:								
Galwa <b>y</b> ,		16	20	28	33	33	25	2
Leitrim,		1	-	3	-	4	4	
Мауо,		7	29	25	27	20	12	1
Roscommon,		7	10	11	30	23	19	2
Aligo,		2	8	10	4	10	2	1
·Fotal,		545	545	613	655	486	889	107 (from 1st Jan. to 8rd Mar., 1906)

The Department have again to urge upon the Local Authorities the importance of exercising the responsibilities imposed upon them in this matter. In the hope that it may assist them in further considering the question, the Department have issued the accompanying "Memorandum on Sheep Dipping." This document deals briefly with the importance and advantages of dipping, the preparations suitable to be used as dips, the mode of carrying out dipping, the approximate cost of dippers, and the powers of Local Authorities both as to provision of dippers and making of regulations as to compulsory dipping, &c. The Memorandum further gives information as to useful general precautions against Sheep Scab, and furnishes particulars, which the Local Authorities may probably find of interest, as to the extensive general dipping carried out last year in the North of Scotland.

The draft Form of Sheep Dipping Regulations which was one of the enclosures to the Department's previous circular, No. 1670/05, has been reprinted (vide Appendix to this present circular), as it may be of help to the Local Authorities in framing their own regulations. The period during which the compulsory dipping prescribed by any such regulations is to be carried out should be restricted within the narrowest practicable limits consistent with the efficient enforcement of the regulations.

In Appendix I. to the Circular will be found particulars of the number of outbreaks of Sheep Scab that came under notice in Ireland during each of the years from 1900 to 1906, inclusive. Many of these outbreaks, it may be mentioned, came to light otherwise than through the help of the owner or his employees. It is to be feared, therefore, that the figures cannot be regarded as showing the whole extent of prevalence of Sheep Scab in the country, but that there should also be taken into account a proportion—how large a proportion there is no means of determining—of further cases in which owners of affected animals may have been successful in concealing the existence of the disease among their flocks.

In forwarding this second circular on the subject, the Department desire earnestly to impress on the Local Authorities the urgent need there is for their putting into operation the powers that have been conferred on them. Apart from the direct benefits of compulsory dipping, of which the country is deprived so long as these powers are not employed, it may be well to indicate that there is another possible consequence of inaction. Sheep Dipping has been taken up with great activity by Local Authorities in Great Britain. Failure on this side of the Channel to adopt similar means for the suppression of Sheep Scab cannot but, in the end, react prejudicially on the large Irish export trade in sheep. It is improbable that the British authorities will be satisfied for an indefinite period to run the risk of having their Sheep Dipping precautions rendered ineffective by the continued free admission of large numbers of undipped sheep from another country.

I have to request that you will be good enough to bring this Circular before the Local Authority at their first meeting. If no meeting is to be held at an early date, the Department consider that the subject is of such importance as to warrant the summoning of a special meeting to consider the question.

I am, Sir,

Your obedient Servant, T. P. GILL,

Secretary.

The Clerk
of each Local Authority.

#### APPENDIX II.

(Reprint of one of the enclosures to Circular No. 1670/05, of 31st March, 1905.)

SUGGESTED FORM OF COMPULSORY SHEEP DIPPING REGULATIONS.

(Note.—This Form will require modification if it be proposed to bring the whole district of the Local Authority instead of a specified part or parts thereof within the scope of the Regulations.)

County of \_\_\_\_\_

#### SHEEP SCAB.

#### COMPULSORY DIPPING OF SHEEP.

The Local Authority of the County of , by virtue and in exercise of the powers conferred on them by the Diseases of Animals Acts, 1894 to 1903, and the Sheep Scab (Local Regulations) (Ireland) Order of 1905, and of every other power enabling them in this behalf do hereby make the following Regulations:—

# Commencement and Extent of Operation.

1.—These Regulations shall come into operation on the day of , 190 , and shall apply to each District described in the First Schedule to these Regulations, hereinafter called a Scheduled District.

Compulsory Dipping of all Sheep in each Scheduled District.

2.—(1.) In each year during which these Regulations are in operation the owner of any sheep which may be in a Scheduled District between the following dates, viz.,

shall cause the same to be treated for sheep-scab between such

dates by effective dipping in an efficient sheep-dip.

(2.) The treatment of sheep prescribed by this Article shall be carried out on such dates, at such dipping places, and in such manner as shall be required by a Notice signed by an Inspector of the Local Authority or other authorised officer, and served by post, or otherwise, on the owner or person in charge of the sheep referred to in the Notice.

(3.) If the owner of any sheep in a Scheduled District fails to treat such sheep in accordance with this Article, the Local Authority may at any time, without prejudice to the recovery of any penalty for such default, cause such sheep to be treated for sheep-scab by effective dipping in an efficient sheep-dip, and may recover summarily the expenses of such treatment from such owner.

# Returns by Owners of Sheep in each Scheduled District.

- 3.—(1.) Every owner of sheep in a Scheduled District shall, within fourteen days after the commencement of these Regulations, and subsequently in the month of April in any year during which these Regulations are in operation, send by post or deliver to the Clerk of the Local Authority a return showing the name or description of the farm or holding or other premises in the Scheduled District upon which the sheep are, the description of his sheep on such farm or holding or other premises, and the number of such sheep so far as such number can reasonably be ascertained.
- (2.) The owner of any sheep brought into a Scheduled District after the date prescribed for the above-mentioned return, shall send or deliver a similar return relating to the sheep so brought into the district.
- (3.) Every return shall be made on a form approved by the Local Authority, who will provide forms for this purpose to owners of sheep applying therefor.

# Restriction on Exposure at Markets, &c.

4. In any year during which these Regulations are in operation, sheep shall not, until after the expiration of the period fixed for the dipping under Article 2 of these Regulations, be exposed for sale or exhibition in any market, fair, saleyard, or place of exhibition in a Scheduled District unless they shall have within twenty-eight days before such exposure been thoroughly dipped in an efficient sheep-dip in the presence, and to the satisfaction, of an Inspector of the Local Authority or other authorised officer.

# Restriction of Movement out of each Scheduled District.

- 5.—(1.) Sheep shall not be moved out of a Scheduled District unless—
  - (i.) they are accompanied by a licence authorising such movement granted by an Inspector of the Local Authority or other authorised officer.
  - (ii.) they are moved direct to a slaughter-house, having previous to such movement been marked by the painting or

stamping with an indelible composition of red colour of a broad line down the back and another broad line across the loins of each sheep, thus +, each line being not less than nine inches long.

- (2.) A licence for movement under this Article shall only be granted—
  - (i.) upon production to the Inspector or other authorized officer granting the licence of (a) a certificate showing that the sheep to be moved have, within twenty-eight days before the licence is granted, been thoroughly dipped in an efficient sheep-dip in the presence, and to the satisfaction, of an Inspector of the Local Authority or other authorized officer; and (b) a declaration signed by the owner of the sheep, or his agent authorized in writing for this purpose, to the effect that the sheep to be moved are sheep referred to in the certificate, and that since the dipping the sheep have been kept separate from other sheep not so dipped; or

(ii.) upon production of (a) a certificate by a duly qualified veterinary surgeon to the effect that he has within ten days before the licence is granted examined each of the sheep to be moved, and found it to be free from sheep-scab, and (b) a declaration signed by the owner of the sheep, or his agent authorized in writing for this purpose, to the effect that since such examination the sheep have been kept separate from other sheep, and have not been exposed in any market, fair, saleyard or exhibition.

(3.) A declaration shall be retained by the Inspector, or other authorized officer, granting a licence thereon. A certificate shall also be so retained unless it refers to more sheep than are proposed to be moved, in which case a note shall be made thereon and initialled by the Inspector, or other authorised officer, who grants the licence, stating the number of the sheep for which the licence is granted.

(4.) The licence shall be in force for six days, inclusive of the day of issue.

(5.) Sheep moved under this article to a slaughter-house within the district of the Local Authority shall after their arrival thereat be there detained until they are slaughtered.

Provisions as to Farms on Borders of Scheduled Districts.

6. Where any farm or holding is situate partly within and partly without a scheduled district, but wholly within the district of the Local Authority, the provisions of these Regulations shall apply to all sheep on such farm or holding as if they were in the scheduled district.

# Certificates of Dipping.

7. Where, under these Regulations, sheep are dipped in the presence, and to the satisfaction, of an Inspector of the Local Authority or other authorized officer, he shall give the owner or person in charge of the sheep a certificate to that effect, on a Form to be provided by the Local Authority.

# Provision for Movement through Scheduled District.

8. For the purposes of these Regulations, sheep shall not be deemed to be moved out of a scheduled district in any case where they are moved through such district by railway from a place outside such district to another place outside such district without unnecessary delay and without the sheep being untrucked or rebooked within such district.

#### Interpretation.

- 9. In these regulations, unless the context otherwise requires—
  "Efficient sheep-dip" has the same meaning as in the Sheep-Scab (Ireland) Order of 1905.
- "Authorized officer" means an officer authorized by the Local Authority for the purposes of Articles 4 and 5 of the Sheep-Scab (Ireland) Order of 1905, or of these Regulations.

Dated at

this

day of

190

Clerk to the Local Authority.

#### SCHEDULE.

District or Districts to which these Regulations apply.

- A district comprising
- A district comprising
- A district comprising

N.B —A person doing or omitting to do anything in contravention of these Regulations is liable under the Diseases of Animal- Acts to prosecution and penalty.

#### MEMORANDUM ON SHEEP-DIPPING.

#### 1. IMPORTANCE AND ADVANTAGES OF DIPPING.

The general enforcement of the efficient dipping of sheep is a most essential aid towards the eradication of that extremely contagious disease known as sheep-scab, which is due to the presence of a parasitic mite on the skin of the animal. Dipping is also of great utility in improving the general condition of sheep by destroying or preventing the attacks of other parasites than that of sheep-scab with which sheep are liable to be infested. The healthy state of the skin thus brought about is further calculated to foster an improvement in the growth and quality of the wool.

On the other hand, partial methods of treatment, such as smearing, pouring, bottle-dressing, to which many sheep owners are tempted to have recourse as a substitute for dipping, are not likely to be attended with equally satisfactory results.

#### 2. SHEEP DIPS FOR SHEEP-SCAB.

Dipping will only be effective if proper materials are used, and if the operation is carried out in a thorough manner. The substances most commonly employed to destroy the scab-mite are preparations of white arsenic, carbolic acid, tobacco, or sulphur.

There are many sheep-dips on sale which have been approved by the Department as effective against sheep-scab. The Department have informed the manufacturers accordingly, and have intimated to them that they are at liberty to label the preparations to that effect when offering them for sale. An alphabetical list of proprietary dips so approved in Ireland up to the present will be found in Appendix A.

Where any such approved preparations are made use of, the instructions issued by the manufacturers as to the method of mixing, the amount of dilution, and as to the period of immersion

should be carefully observed.

In Appendix B are given particulars as to the composition of three preparations which can be compounded on the sheep-owner's homestead, and which have been proved by experiment to be suitable for use as sheep dips without detriment to the fleeces of the animals dipped, and, if properly employed, to be effective against sheep-scab.

#### 3. Mode of Carrying out Dipping.

The operation of dipping is most usually carried out by means of either the hand bath or the swim bath.

#### The Hand Bath.

The simplest form of bath is made of wood, galvanized iron, or earthenware. It measures some 4 feet in length and depth and  $1\frac{3}{4}$  feet in width, and is provided with a suitable drainer. In this bath the animal is immersed by turning it on to its back, and holding its head above water. The advantages that this form of bath possesses consist in its low cost, and in requiring comparatively little liquid to fill it; while its disadvantages consist in (a) the unnatural position of the sheep and the consequent risk of poison "running" into its mouth and nose; (b) the laborious character of the work, especially in keeping the sheep on the drainer; (c) the slightly dangerous nature of the work for the labourers; and (d) the danger of abortion to in-lamb ewes. The hand bath requires more men to work it than the swim bath.

#### The Swim Bath.

The swim bath is made in two forms, being either so narrow (under two feet) that a sheep can only swim forward, or so broad  $(3\frac{1}{2}$  feet) that sheep can swim round in it. A form of bath or tank extensively used on the larger pastoral farms in Scotland consists of a trough with sloping ends, some 33 feet long at the top, 20 feet 6 inches long at the bottom, and 5 feet deep. The width is about 20 inches, only allowing room for the sheep to pass through the bath in single file. The bottom of the trough is

somewhat narrower than the top. The sheep are dropped or slid in at one end, and after slowly swimming through the bath, pass up the inclined plane at the other end to a dripping stage or draining pen. Other somewhat similar tanks are about the same width but considerably shorter.

## Improvised Dippers.

In places where it is difficult to obtain either fixed or portable dippers, the following method, which has been successfully used in the Transvaal, could be adopted in emergencies, viz.: - Dig a hole or trench in the ground and line it with a tarpaulin or waterproof canvas. The length of the bath will depend upon the size of the tarpaulin available. It is undesirable, where there is no intention of dipping a large number of sheep, to have a bath of this kind of greater length than 20 feet, as the longer the bath the larger will be the quantity of dipping material required. The tarpaulin can be kept in position by putting large stones on its top edges. Rough gangways of boards, fitted with some cross battons, can be laid on the tarpaulin at the inclined exit from the bath, in order to protect the tarpaulin from the wear and tear of the feet of the sheep. A gangway leading to the plunging or entrance end of the dipper can be made with hurdles, which should project a short distance along the sides of the trench, so as to prevent the sheep from jumping sideways.

## Protective Arrangements.

The utmost care should be taken to guard against sheep that have been dipped coming in contact or mixing with sheep that have not been dipped. Some penning arrangements for temporary reception of the dipped sheep are, therefore, a very desirable adjunct on such occasions. To prevent needless pollution of the dipping fluid any pen or gangway admitting to the dipper should have its flooring so sloped as to drain away from, not towards, the bath. It will be well, moreover, to sweep such flooring clear of dung, &c., from time to time before a fresh lot of sheep is allowed in.

Where large numbers of sheep are being dipped fresh dipping solution should be added now and again as occasion may require, and, in order to cleause the fluid as far as practicable from fouling material, a wooden rake should be passed at intervals over the surface and along the bottom of the bath.

The safe disposal of the spent dip following dipping is also a point that needs attention; and where, in this connection, the dip is required to be removed from a fixed tank or dipper, a small pump will be found useful in facilitating the process.

#### 4. APPROXIMATE COST OF DIPPERS.

Galvanised iron swim baths about 9 feet long, 4 feet deep, and 3 feet 6 inches wide, with draining floor 24 feet long and 4 feet wide, cost approximately £11.

Galvanised portable dipping tanks, with drainer and slide, on same general plan as that indicated in sketch No. 1 in Appendix

C, can be had at prices ranging from £3 10s. to £4 12s. 6d., according to size. These are, however, suitable only for dealing with small numbers of animals.

Travelling dippers, as shown in Appendix C, vary in price from

£25 upwards.

Concrete dipping tanks may cost from about £50 upwards. A reduction in this figure may, however, be practicable where local labour and material can be had at cheap rates.

The expense involved in constructing an improvised dipper will be merely the cost of the tarpaulin, hurdles, wooden gangways,

and of the labour required in digging the trench.

5. Powers of Local Authorities to provide Dippers.

Section 3 of the Diseases of Animals Act, 1903, empowers local authorities to

"Provide, fit up, and maintain portable 'dipping tanks,'
"or, with the sanction of the Department, 'dipping places,'
"and 'to afford the use thereof, and of all necessary appli"ances and materials in connection therewith, to the public
"upon such terms and conditions as the local authority may
"think fit, and any sums received by a local authority for
"such use shall be applied by them towards the discharge of
"their expenses under the Diseases of Animals Act, 1894."

#### It is at the same time provided

"That no dipping place shall be used for the purpose of this Section if such use would injuriously affect the water in any stream, reservoir, aqueduct, well, pond, or place constructed or used for the supply of water for drinking or other domestic purposes."

# 6. Powers of Local Authorities to make Regulations as to compulsory Dipping, &c.

With a view to the suppression of sheep-scab wide powers have, by order of the Department made under the Diseases of Animals Acts, been conferred upon local authorities in Ireland as regards the making of regulations applicable to the whole or any part of their administrative area, for requiring sheep owners to dip their sheep within a prescribed period each year in an efficient sheep dip approved by the Department.

An extract from the Order referred to is subjoined: —

- 1. A local authority may, with the view of preventing the spreading of sheep-scab, make such regulations as they think fit for the following purposes, or any of them:—
- (a) For prescribing, regulating, and securing the periodical treatment by thorough dipping in an efficient sheep-dip of all sheep within their district, or within any part or parts thereof.

(b) For prohibiting or regulating the movement by land or by water of sheep into their district from the district

of any other local authority in Ireland.

- (c) For regulating the subsequent movement of sheep which have been moved from outside their district to a place of destination within such district.
- (d) For requiring the occupier of any premises within their district to which sheep are moved from outside such district to notify forthwith the arrival of the sheep to the local authority.
- (e.) For prohibiting or regulating the movement by land or by water of sheep within the whole of their district, or within any part or parts thereof.
- (f) For prohibiting or regulating the exposure or sale of sheep in or at any market, fair, auction, sale-yard, sale, or place of exhibition within their district.

#### 7. STEPS TAKEN IN SCOTLAND FOR THE ERADICATION OF SHEEP-SCAB.

It may be advantageous to append a short account of what was done in the Highlands and islands of Scotland in the summer of 1905 to secure the general dipping of sheep. The following information is summarised from an interesting and useful article which appeared in the issue of the *Journal* of the Board of Agriculture and Fisheries for December, 1905:—

Under an Order of the Board of Agriculture and Fisheries the efficient dipping of all sheep within an area covering eighteen counties, or about two-thirds of the entire country, was required to be carried out between the 15th July and 31st August, before the commencement of the annual general movement from the Highlands to the southern districts.

The portion of Scotland in which dipping was thus to be enforced had a sheep population of more than three and a-half millions, and included some very wild and difficult country, such as islands, mountains, moor, and forest, where the obstacles to the success of a general dipping order would be strongest.

The very cordial support, however, given to the Order by the local authorities and the chief flockmasters of the district affected, enabled the regulations to be carried out successfully in nearly

every case within the time appointed.

In order to prevent any evasion of the regulations it was decided that the dipping was to be carried out under the supervision of the local authorities, and in one of the dips approved by the Board of Agriculture and Fisheries. All owners of sheep were required to give adequate notice to the local authorities of the date when they proposed to dip, in order that proper supervision on the part of the local authorities might be provided for, and they were to produce, if necessary, satisfactory evidence that the prescribed dipping had been thoroughly and efficiently carried out. For this purpose proper forms were printed and circulated.

Some Inspectors of the Board of Agriculture and Fisheries also

visited and watched the work in the dipping area.

The work of inspection and supervision was carried out energetically in all cases, and by the willing co-operation of the flock-masters the general dipping was completed by the end of August.

The cost to the local authorities of the operations varied very greatly. In Perthshire, where the sheep population is about 660,000, it is said to have reached £1,000; in Fife, where there are 105,000 sheep, £200; in Argyllshire, for 840,000 sheep, £155; and, in Aberdeenshire, £80, for 200,000 sheep. These figures

include the expenses of printing and advertising.

There is no doubt that in every case the dipping was carried out to the utmost ability of the owner. But the practical difficulties were often very great. Care had to be exercised to secure a complete gathering in the hill districts, to keep the sheep long enough in the bath when a large number had to be dipped in a given time, and to secure the isolation of the dipped from the undipped sheep. In one case an owner had in his hands over 30,000 sheep, of which 15,000 had to be brought to one place to be dipped. Some of the sheep had to be driven over very wild country nine miles to the dipper, and during the work, which lasted for a fortnight, the shepherds were fully employed from daybreak to dark.

The experience gained during the summer of 1905 proves that with the co-operation of the local authorities and the flockmasters a general dipping of sheep within a fixed period of some six weeks is quite possible, even under such difficult conditions as obtain in the Highlands of Scotland.

#### 8. GENERAL OBSERVATIONS.

In any district where sheep-scab is known or suspected to exist it is most important that adequate precautions should be adopted to safeguard the dipped flocks against the introduction of the disease.

1. Care should be taken to collect and burn all loose wool torn from the fleeces of sheep affected with scab, and which may be found adhering to hedges, bushes, gates, gate-posts, or trunks of trees, &c., in the fields or grazing lands where affected sheep have been kept.

2. All doors, gates, gate-posts with which diseased sheep may have come in contact should be cleansed and disinfected as far as practicable. It is advisable that useless shrub and hedge cuttings, which do not admit of being properly cleansed

and disinfected, should be removed and burned.

3. Newly purchased sheep should not be allowed to mix with those already on a farm until it is ascertained that the fresh sheep are free from disease, or until they have been efficiently dipped in an approved dip.

4. A similar course should be adopted as regards unsold sheep brought back from a market or fair before they are

again mixed with other sheep.

5. Fences of fields in which sheep are grazed should be kept in proper order.

DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND, UPPER MERRION-STREET, DUBLIN, February, 1906.

#### APPENDIX A.

### ALPHABETICAL LIST OF SHEEP DIPS

Which have been approved up to 28th February, 1906, by the Department of Agriculture and Technical Instruction for Ireland, under the Sheep-Scab (Ireland) Order of 1905, in addition to those specified in the Second Schedule to that Order:—

Name of Dip.	Name and Address of Manufacturer or Proprietor.
Antiseptic Dip Do. (Hot Water Quality)	The North of Ireland Chemical Company, Limited, Belfast.
Bailey's Powder Sheep Dip Bailey's Fluid (non-poisonous) Sheep Dip and Cattle Wash	William Bailey & Son, Horsley Fields Works, Wolverhampton.
Battle's Fluid Sheep Dip Battle's Powder Dip Battle's Paste Dip, Non-Poisonous Battle's Paste Dip, l'oisonous	Battle, Maltby & Bower, Victoria Chemical Works, Lincoln.
Bigg's "Glenovis" Bigg's Paste Dip	Thomas Bigg, 111 Great Dover-street, London, S.E.
Cooper's Sheep-Dipping Powder Cooper's Fluid	Wm. Cooper & Nephews, Chemical Works, Berkhamsted.
Fielding's Liquid Sheep Dip	P. J Fielding, F.c.s., 66, Patrick-street Cork.
"Golden Magnet" Sheep-Dipping Powder	Cope Bros. & Co., Limited, Lord Nelson- street, Liverpool,
Gorry's Powder Dip	Mr. Joseph Gorry, 54, South Main-street, Naas.
Grindley's "Pioneer Brand" Sheep Dip	Grindley & Co., Ltd., Poplar, London, E.
Harrington's Specific Sheep Dip	Cork Chemical and Drug Co., Ltd., Cork.
"Harvey's Improved Sheep Dip"	Mr. J. W. Harvey, L.P.S.I., 31, Great George's-street, Cork.
Hibernia Sheep Dip	Messrs Snowdon, Sons & Co., Ltd., Milwall, London, E.
"Highland" Fluid Sheep Dip "Highland" Powder Sheep Dip	Alex. Robertson, Argyle Chemical Works, Oban, N.B.
"Ialine" Sheep Dip	Burt, Bolton & Haywood, Limited, 64, Cannon-street, London.
Improved Concentrated Liquid Sheep Dip	Messrs. M'Dougall Bros., 68, Port-street, Manchester.
Jeyes' Sheep Dip	Jeyes' Sanitary Compounds Co., Ltd., 64, Cannon-street, London, E C
"John o' Gaunt" Fluid Dip "John o' Gaunt" Paste Dip	Mandsley & Son, The Arcade, Lancaster.

Name of Dip.	Name and Address of Manufacturer or Proprietor.
Kiloh's Non-Poisonous Liquid Sheep Dip Kiloh's Sheep-Dipping Composition Kiloh's Sheep-Dipping Powder	Messrs. Kiloh & Co., Ltd., Cork.
Lawes' Fluid Dip Lawes' Kalyptos Sheep Dip Lawes' Paste Dip, Poisonous Lawes' Paste Dip, Non-Poisonous Lawes' Powder Dip	Lawes' Chemical Co., Ltd., 59, Mark-lane, London, E.C.
Liquid or Cold Water Quality Sheep Dip	Messrs. M'Dougall Bros., 68, Port-street, Manchester.
Little's Non-Poisonous Cake Sheep Dip Little's Non-Poisonous Fluid Sheep Dip Little's Non-Poisonous Paste Sheep Dip Little's Poisonous Liquid Dip Little's Poisonous Powder Sheep Dip	Messrs. Morris, Little and Son, Limited, Doncaster.
Mallen's Carbolic Paste Dip Mallen's Powder Dip	Mallen and Co., 89, Upper Dorset-street, and Blessington-lane, Dublin.
Martin's Hellebore and Carbolic Sheep Dip	Mr. John Martin, 50, West Scotland-street, Glasgow.
M'Dougall's Sheep Dip, Paste or Hot Water Quality M'Dougall's Sheep Dip (Cakes and Blocks), Hot Water Quality (patented) M'Dougall's Arsenic Sulphur Dip	Mesers. M'Dougall Bros., 68, Port-street, Manchester.
M'Leod's Non-Poisonous Sheep Dip M'Leod's "Universal" or Poisonous Sheep Dip	Messrs. F. H. M'Leod and Sons, 61 Bishop-street, Anderston, Glasgow.
Non-Poisonous Paste "Highland" Sheep Dip	Alex. Robertson, Argyle Chemical Works, Oban, N.B.
"Ovizal" Fluid Sheep Dip	Messrs. Hay, Steven, & Co., Kelvindock Chemical Works, Maryhill, near Glasgow
Poisonous Paste "Highland Sheep Dip	Alex. Robertson, Argyle Chemical Works, Oban, N.B.
Quibell's Combined Paste Dip (Arsenical and Carbolic) Quibell's Liquid Sheep Dip Quibell's Non-Poisonous Cake Dip Quibell's Powder Sheep Dip	Messrs, Quibell Bros., Ltd., Newark England.
Snowdon Sheep Dip	Messrs. Snowdon, Sons, & Co., Ltd. Milwall, London, E.
Special Fly Dip	The North of Ireland Chemical Co. Ltd., Belfast.
Special "Highland" Fly Dip	Alex. Robertson, Argyle Chemical Works Oban, N.B.
The "Universal" Sheep Dipping Powder	The North of Ireland Chemical Co., Ltd., Belfast.

#### APPENDIX B.

SECOND SCHEDULE OF THE SHEEP-SCAB (IRELAND) ORDER, 1905.

## PRESCRIPTIONS FOR SHEEP-DIPS APPROVED BY THE DEPARTMENT FOR SHEEP-SCAB.

(Quantities for 100 gallons of bath.)

### 1. Lime and Sulphur.

Mix 25 lbs. of flowers of sulphur with  $12\frac{1}{2}$  lbs. of good quick-lime. Triturate the mixture with water until a smooth cream without lumps is obtained. Transfer this to a boiler capable of boiling 20 gallons, bring the volume of the cream to 20 gallons by the addition of water, boil and stir during half an hour. The liquid should now be of a dark red colour; if yellowish, continue the boiling until the dark red colour is obtained, keeping the volume at 20 gallons. After the liquid has cooled, decant it from any small quantity of insoluble residue, and make up the volume to 100 gallons with water.

## 2. Carbolic Acid and Soft Soap.

Dissolve 5 lbs. of good soft soap, with gentle warming, in 3 quarts of liquid carbolic acid (containing not less than 97 per cent. of real tar acid). Mix the liquid with enough water to make 100 gallons.

#### 3. Tobacco and Sulphur.

Steep 35 lbs. of finely-ground tobacco (offal tobacco) in 21 gallons of water for four days. Strain off the liquid, and remove the last portions of the extract by pressing the residual tobacco. Mix the whole extract, and to it add 10 lbs. of flowers of sulphur. Stir the mixture well to secure an even admixture, and make up the total bulk to 100 gallons with water.

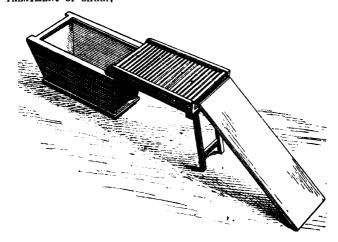
Note.—The period of immersion in these dips should not be less than half a minute.

The above preparations can be compounded on the homestead.

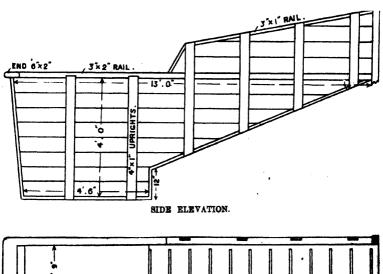
Although no preparation containing arsenic has been included in the above-mentioned Schedule, it is not to be assumed from this omission that the arsenic dips are not thoroughly effective against Sheep-Scab. The possible danger to human beings attendant upon the preparation of arsenical dips renders it advisable, however, that they should be compounded by qualified persons only.

#### APPENDIX C.

PLANS OF PORTABLE AND FIXED DIPPING-TANKS REPRINTED BY THE KIND PERMISSION OF THE CONTROLLER OF H. M. STATIONERY OFFICE FROM APPENDIX IV. IN THE REPORT OF THE DEPARTMENTAL COMMITTER APPOINTED BY THE BOARD OF AGRICULTURE AND FISHERIES TO INVESTIGATE EXPERIMENTALLY AND REPORT UPON CERTAIN QUESTIONS CONNECTED WITH THE DIPPING AND TREATMENT OF SHEEP,

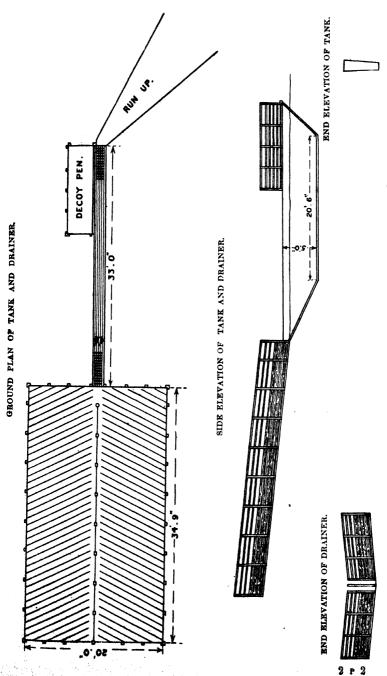


L-PORTABLE DIPPING-TANK WITH DRAINER.

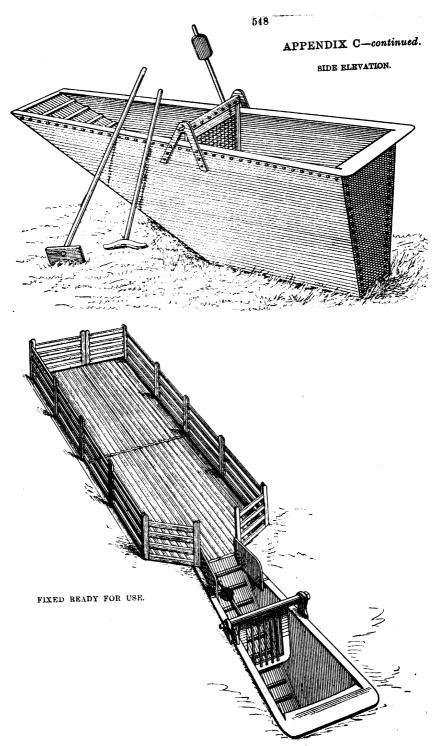


J'x2'RAIL.

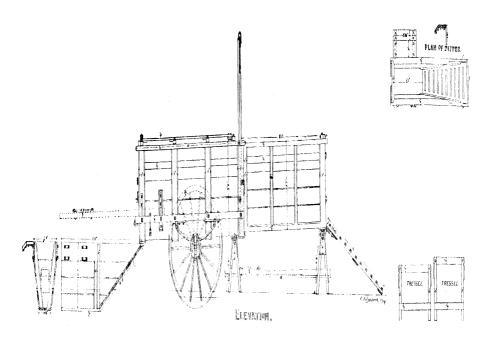
II.—INEXPENSIVE FORM OF FIXED DIPPING-TANK.

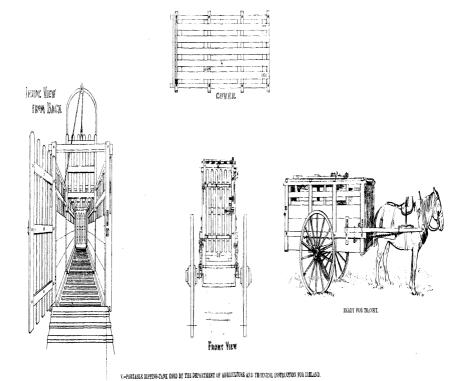


III. "LONG FORM OF DIPPING-TANK, LARTBLY USED IN SCOTLAND



IV.-COOPER'S PATENT SWIM-BATH





LIST OF SHEEP DIFFING PREPARATIONS approved by the Department of Agriculture and Technical Instruction for Ireland, under the Sheep Scab (Ireland) Order of 1905, additional to those specified in the Second Schedule of that Order. (See *Journal*, Vol. V., No. 3, p. 564, and Vol. VI., No. 2, p. 334).

LIST No. 5.

(NOTE.—Consecutive numbers will be given to any lists of a similar character that may be subsequently issued).

	Proportion appro		
Name of Dip.	Quantity of Dip.	No. of Gallons of Water.	Name and Address of Manufacturer.
"Ovizal" Fluid Sheep Dip, Little's Poisonous Liquid Dip, Little's Non-Poisonous Cake Sheep Dip, Little's Non-Poisonous Paste Sheep Dip, Fielding's Liquid Sheep Dip,	1 gallon,  1 ,,  1 lb.  1 ,,  1 pint,	100 50 2 2 10	Messrs. Hay, Stephen & Company, Kelvindock Chemical Works, Maryhill, near Glasgow.  Messrs. Morris, Little & Son, Ltd., Doncaster.  Mr. P. J. D. Fielding. 66, Patrick Street, Cork.

## NOTES AND MEMORANDA.

A meeting of the Agricultural Board was held on Tuesday, 13th February, at the offices of the Department, Upper Merrion-street, Dublin. Meetings of the Boards.

The following members of the Board were

present: -The Right Hon. Sir Horace Plunkett, P.C., K.C.V.O., F.R.S., Vice-President of the Department, in the chair; Mr. Alexander L. Clark, J.P.; Mr. Robert Downes, J.P.; Colonel Nugent T. Everard, D.L.; Sir Josslyn Gore-Booth, Bart.; His Grace the Most Rev. John Healy, D.D., Lord Archbishop of Tuam; Mr. Patrick J. Hogan, J.P.; Most Rev. Denis Kelly, D.D., Lord Bishop of Ross; Mr. Arthur S. Lough, J.P.; The Right Hon. Lord Monteagle, K.P., D.L.; Mr. H. de F. Montgomery, D.L.; Colonel John P. Nolan, J.P.; and Mr. Patrick J. O'Neill, J.P.

Mr. T. P. Gill, Secretary of the Department; Professor J. R. Campbell, Assistant Secretary in respect of Agriculture; Mr. R. Cantrell, 1.s.o., Chief Clerk; Mr. W. G. S. Adams, M.A., Superintendent of the Statistics and Intelligence Branch; Mr. J. P. Walsh, Clerk in Charge of Accounts; Mr. J. D. Daly, M.A., Senior Staff Officer (who acted as Secretary to the meeting), and Mr. J. V. Coyle, were also present.

A meeting of the Agricultural Board was held on Tuesday, 20th March, at the offices of the Department, Upper Merrion-street, Dublin.

The following members of the Board were present: -The Right Hon. Sir Horace Plunkett, P.C., K.C.V.O., F.R.S., Vice-President of the Department, in the chair; Mr. Alexander L. Clark, J.P.; Mr. Robert Downes, J.P.; Colonel Nugent T. Everard, D.L.; Sir Josslyn Gore-Booth, Bart.; Mr. Patrick J. Hogan, J.P.; Most Rev. Denis Kelly, D.D., Lord Bishop of Ross; Mr. Arthur S. Lough, J.P.; The Right Hon. Lord Monteagle, K.P., D.L.; Mr. H. de F. Montgomery, D.L.; Colonel John P. Nolan, J.P.; and Mr. Patrick J. O'Neill, J.P.

Mr. T. P. Gill, Secretary of the Department; Professor J. R. Campbell, Assistant Secretary in respect of Agriculture; Mr. R. Cantrell, 1. s.o., Chief Clerk; Mr. W. G. S. Adams, M.A., Superintendent of the Statistics and Intelligence Branch; Mr. J. P. Walsh, Clerk in Charge of Accounts; Mr. J. D. Daly, M.A., Senior Staff Officer (who acted as Secretary to the meeting), and Mr. J. V. Coyle, were also present.

A meeting of the Board of Technical Instruction was held on Tuesday, the 14th March, at the offices of the Department, Upper Merrion-street, Dublin. The following were present:—The Right Hon. Sir Horace Plunkett, P.C., K.C.V.O., F.R.S., Vice-President of the Department, in the chair; Mr. Frank Barbour; Mr. James Dempsey; Mr. Christopher J. Dunn, J.P.; Rev. T. A. Finlay, S.J., F.R.U.1.; Sir James Henderson, D.L.; Sir Otto Jaffé, J.P.; Very Rev. P. J. Lally, P.P.; Mr. W. R. J. Molloy, M.R.I.A.; Mr. Alexander Taylor, and Mr Thomas H. Teegan.

Mr. T. P. Gill, Secretary of the Department; Mr. George Fletcher, Assistant Secretary in respect of Technical Instruction; Mr. W. G. S. Adams, M.A., Superintendent of the Statistics and Intelligence Branch; Mr. W. Vickers Dixon, B.A., Senior Inspector for Technical Instruction; Mr. J. D. Daly, M.A. (who acted as Secretary to the meeting), and Mr. A. Kelly, were also present.

The Board had under consideration the following amongst other matters:—the necessity for further funds to enable local authorities to erect suitable buildings for technical schools; the training and employment of teachers of commercial subjects; the scheme of technical instruction in respect of the Session 1905-6 for the Urban District of Athlone; provision for a further central course for the training of Manual Instructors; and proposals in regard to higher schools of Domestic Economy.

A meeting of the Joint Committee appointed by the several
Urban County Districts in the county of

Joint Committee of Dublin under Section 10 (b) of the Agriculthe County Dublin ture and Technical Instruction (Ireland)

Act, 1899, was held on the 30th March, 1906,
at the offices of the Department of Agriculture and Technical Instruction, Upper Merrion-street Dublin.

There were present:—Mr. Richard W. Booth, J.P. (Dalkey); Mr. Thomas Edmondson, J.P. (Rathmines and Rathgar); Mr.

A. V. M'Cormick (Kingstown); Mr. D. L. Ramsay, J.P. (Pembroke); Mr. William Wallace, J.P. (Blackrock); Mr. Joseph Ward, J.P. (Killiney and Ballybrack).

Mr. Richard W. Booth, J.P., was moved to the chair.

Mr. Thomas Edmondson, J.P., was appointed a member of the Board of Technical Instruction.

On the motion of Mr. Ramsay, seconded by Mr. Wallace, a hearty vote of thanks was passed to Professor Thomas H. Teegan for his services on the Board during the past three years.

A meeting of the Consultative Committee of Heads of Secondary
Schools, appointed to confer with the
Committee of Heads Department with reference to the extended
of Secondary Schools.

Art instruction, was held at the offices of
the Department on Tuesday, 3rd April. The proceedings commenced at 11.30 o'clock.

There were present: -Rev. William Anderson, M.A., Headmaster, Mountjoy School, Dublin (representative of the Teachers' Guild); Very Rev. Michael Barrett, D.Ph., St. Colman's College, Fermoy (representative of the Convent Schools Committee); Very Rev. Dr. Crehan, c.s.sp., President, Blackrock College (representative of the Catholic Headmasters' Association); Mr. Thomas A. Finch, M.A., Principal, Educational Institution, Dundalk (representative of the Schoolmasters' Association); Mr. W. W. Haslett, M.A., Principal, St. Andrew's College, Dublin; Rev. Brother P. J. Hennessy (representative of Christian Brothers' Schools); Mr. R. M. Jones, M.A., Principal, Royal Academical Institution, Belfast; Mr. James Moore, B.A., Principal, Masonic Boys' School, Clonskeagh; Very Rev. Andrew Murphy, Adm., Limerick (representative of the Catholic Headmasters' Association); Mrs. Thompson, M.A. (representative of the Schoolmistresses Association); Very Rev. N. J. Tomkin, s.J., Belvedere College, Dublin (representative of Jesuit Schools).

The following represented the Department:—The Right Hon. Sir Horace Plunkett, P.C., K.C.V.O., F.R.S., Vice-President of the Department; Mr. T. P. Gill, Secretary; Mr. George Fletcher, F.G.S., Assistant Secretary in respect of Technical Instruction; Mr. W. G. S. Adams, M.A., Superintendent of the Statistics and Intelligence Branch; Mr. J. D. Daly, M.A., who acted as Secretary to the meeting, and Mr. A. Kelly.

Miss E. Steele, Victoria College, Belfast, representative of the Ulster Schoolmistresses Association, was unavoidably prevented from attending the meeting.

The Committee had under consideration several matters relating to the Department's Programme of Experimental Science, Drawing, Manual Instruction, and Domestic Economy in Day Secondary Schools.

A meeting of the Department's Advisory Committee on Live Stock (exclusive of horses) was held at the offices of the Department, Upper Merrion-street, on the 10th January, at which the following members were present, viz.:—

Mr. T. P. Gill, Secretary of the Department, in the chair; Professor J. R. Campbell, Assistant Secretary in respect of Agriculture; Mr. R. A. Anderson; Mr. R. Barter; Mr. J. Byrne; Mr. Toler R. Garvey, and Captain J. Lewis Riall.

Mr. James Wood, Inspector, was also present and acted as Secretary to the meeting.

A Royal Commission has been appointed to inquire into the Canals Canal Commission.

and Inland Navigations of the United Kingdom, and to report on:—

- (1.) Their present condition and financial position;
- (2.) The causes which have operated to prevent the carrying out of improvements by private enterprise, and whether such causes are removable by legislation;
- (3.) Facilities, improvements, and extensions desirable in order to complete a system of through communication by water between centres of commercial, industrial, or agricultural importance, and between such centres and the sea;
- (4.) The prospect of benefit to the trade of the country compatible with a reasonable return on the probable cost;
- (5.) The expediency of canals being made or acquired by public bodies or trusts and the methods by which funds for the purpose could be obtained and secured, and what should be the system of control and management of such bodies or trusts.

The following are the Royal Commissioners:—The Right Hon. Lord Shuttleworth (Chairman), The Lord Kenyon, The Lord Brassey, K.C.B.; The Lord Farrer, The Right Hon. Sir John Dorington, Bart.; Sir John Brunner, Bart.; Sir Francis Hopwood, K.C.B., C.M.G., Permanent Secretary to the Board of Trade; W. J. Crossley, Esq., M.P.; Russell Rea, Esq., M.P.; J. F. Remnant, Esq., M.P.; P. Snowden, Esq., M.P.; Henry Vivian, Esq., M.P.; L. A. Waldron, Esq., M.P.; R. C. H. Davison, Esq., C.E.; J. P. Griffith, Esq., C.E.; Dr. A. J. Herbertson, J. C. Inglis, Esq., C.E.; H. F. Killick, Esq., and John Wilson, Esq.

Mr. W. B. Duffield, M.A., will act as Secretary to the Royal Commission.

Mr. Consul-General Neville-Rolfe states in his report (Cd. 2682-55
—1906) on the trade of South Italy, that
Southern Italy: the following articles are imported from IreIrish Imports. land:—White linens in light, medium and
heavy makes, which are used for underwear;
cuffs and collars; sheets and pillow-cases; white dress linens; brown

hollands; white linen handkerchiefs; white cambric handkerchiefs; white Batiste hemstitched handkerchiefs; white Batiste hemstitched handkerchiefs; white Batiste hemstitched borders.

There is a falling-off in the sale of linens, due to the increasing use of cotton for sheets, and also to some extent for collars even. The same applies to handkerchiefs, of which now large quantities are sold in cotton. In none of these articles is there, so far, any competition from Italian makes. Italian makers are unable to finish piece-goods or handkerchiefs with the perfection that Irish manufacturers do, and hence confine themselves to making the unfinished partially bleached linens used in the country and the commoner grades of table linen.

The increasing production and the extraordinary improvement which has taken place in Italian textiles has caused the Italian Government to establish a school of textiles at Naples, in connection with the scheme for the industrial future of the city. The new weaving school will be supported by a grant of

the city. The new weaving school will be supported by a grant of 16,000 fr. (£640) from the Ministry of Commerce and Agriculture, the contributions of firms interested in obtaining the best class of workmen, and the school fees of the pupils. A further sum of £800 will be granted by the Government for the erection of the plant. Instruction will be given in the arts of weaving wool, cotton and hemp. Another branch of instruction will be given in

the designs of stuffs, and in the dyeing both of threads and of stuffs already woven; and an evening school will be opened for the improvement of such operatives as are already engaged in the trade. The whole course of instruction will extend over three years, the pupils will enter at twelve years of age, and must have procured a diploma either from a technical school, a school of arts and crafts, or an elementary commercial school. The institution will be presided over by an appointee of the Ministry, and the rest of the Committee will be founded by a delegate from the province, one from the city, one from the Chamber of Commerce, and the headmaster of the school. The scheme is so thoroughly practical that great things may be expected from it.

The Report on the Irish Migratory Labourers in 1905 (Cd. 2865-

The Migratory
Agricultural
Labourers.

1906) has just been issued by the Department of Agriculture and Technical Instruction for Ireland. This annual report does not deal with the wide class of free and

floating labour which is common in some degree to all countries, but has special reference to the annual movement of a large number of agricultural workers from Connaught and parts of Ulster who find temporary employment, mainly as potato-diggers and harvesters, in England and Scotland, and who at the close of the season return for several months to their homes, chiefly in the West and North-west of Ireland.

It appears from the report that approximately 25,000 migratory

The Number of Migrants.

labourers went to England and Scotland during the past season. Of these over 20,000 went to England, while about 4,500 went to Scotland, some of whom, however, would find

their way during the season into Northumberland. Only a small number of the class of migratory labourers under consideration found employment in Ireland.

With regard to the annual variations in the number of migratory labourers it appears that there was a decline of over 2,000 in the year 1905 as compared with the year 1904. Of recent years the number of migrants has been decreasing. Summarising the history of recent years in the matter of numbers it may be said that there was a marked falling off in the numbers of Irish migratory labourers in the years from 1880 to 1888, that between 1888 and 1901 the

numbers as shown by the Constabulary enumeration considerably increased, as did also in a less degree those furnished by the railways and by the enumerators at the ports, and that since 1901 the numbers have again been declining, the decrease being greater in the past year than in any of those immediately preceding.

It would appear that roughly three-fourths of the migratory

Where the 'Harvestmen' come from.

labourers in 1905 were natives of the province of Connaught, and that of this number two-thirds came from the County of Mayo. As far back as the records of the harvest

migratory labourers go, County Mayo has been the principal source of the migratory labourers. In Mayo the largest numbers migrate from the Poor Law Unions of Swineford, Westport, Castlebar, Claremorris, Ballina, and Belmullet. From none of the other counties of Connaught is the movement so widespread or so strongly marked. A very considerable number, however, come from Roscommon; but of these 93 per cent. are from the Poor Law Union of Castlereagh. In County Sligo it is chiefly from the Poor Law Union of Tobercurry, and in County Galway where the numbers are more distributed, from the Poor Law Unions of Glennamaddy, Tuam, and Mountbellew, that the labourers are drawn. The numbers from Leitrim are small.

Ulster is the only other province from which there is any large movement of harvest migratory labourers, and of these over 80 per cent. are Donegal men. The number of migratory labourers in Donegal is, however, much lower proportionately to the population of the County than in Mayo, and may be fairly compared to the migration from Roscommon. In Donegal the Poor Law Unions from which the majority of the migratory labourers come are Glenties, Dunfanaghy, and Milford. In Ulster, outside Donegal, the largest number of migratory labourers is from County Armagh. From no counties in Leinster and Munster is there any considerable movement of harvest labourers to England or Scotland.

As a result of inquiries made as to the number of migratory labourers who are landholders and as to the Social and Economic size of their holdings, it appears that of the migratory labourers from Connaught 2,599, the 'Harvestmen.' or 23 per cent. were landholders, from Ulster, 404 or 14 per cent. As to the size of the holdings, the number of labourers having holdings "not ex-

ceeding 5 acres" was in Connaught 341, as against 2,258 with holdings "exceeding 5 acres"; and in Ulster 106, as against 298 with holdings "exceeding 5 acres." Of the holdings in Ireland exceeding 5 acres which belong to migratory labourers, 88 per cent. are of a size not exceeding 20 acres. There are, however, cases in which holders of large tracts of land exceeding 100 acres in extent make a living out of their earnings as migratory labourers—the land of such holders consisting almost entirely of what is classified in the Agricultural Statistics as "barren mountain" and "waste." Thus it was found that on 24 holdings exceeding each 100 acres, of which the occupants were returned as migratory labourers, a total of 60 acres represented the amount cultivated for corn and root crops, while the area under hay amounted to 65 acres, the remainder consisting of poor pasture and of waste and barren mountain land.

It may be added that to a very large extent the non-landholding migratory labourers consist of the sons and daughters of holders, and that they are returned as working when at home on their parents' farms.

Where do the 'Harvestmen' go? the destination of the migratory agricultural labourers and it has been found that these labourers form three groups. There are:—

- (1) The Achill workers, both male and female, employed by potato merchants and farmers in Scotland;
- (2) The Donegal men who go to Scotland and Northumberland as emergency workers and harvesters; and
- (3) The Connaught men who go to England. They are employed mainly in hoeing, harvesting, and in potato and turnip lifting.

On the 6th March, a deputation from the Associated Chambers of

Canadian Cattle:

A Plea for the continuance of the Embargo.

Agriculture waited on the President of the Board of Agriculture and Fisheries (Earl Carrington) to urge the great desirability of the continuance of the present restrictions on the importation of Canadian cattle.

With Earl Carrington were Sir Edward Strachey, Bart., M.P.; Sir T. H. Elliott, K.C.B., Secretary to the Board, and others.

The deputation was introduced by Mr. Courtenay Warner, M.P., the Chairman of the Associated Chambers of Agriculture. Mr.

Warner said the deputation represented eighty-eight societies of agriculturists. They objected to the conveying of foreign cattle about the country with the possibility of spreading disease. Mr. St. John Ackers said that both farmers and breeders were represented by the deputation. It would be a calamity not only to them, but to the consumers, if cattle disease were introduced into the country. There was, he said, no shortage of supply such as would necessitate, in the interests of the consumers, a free importation of foreign cattle.

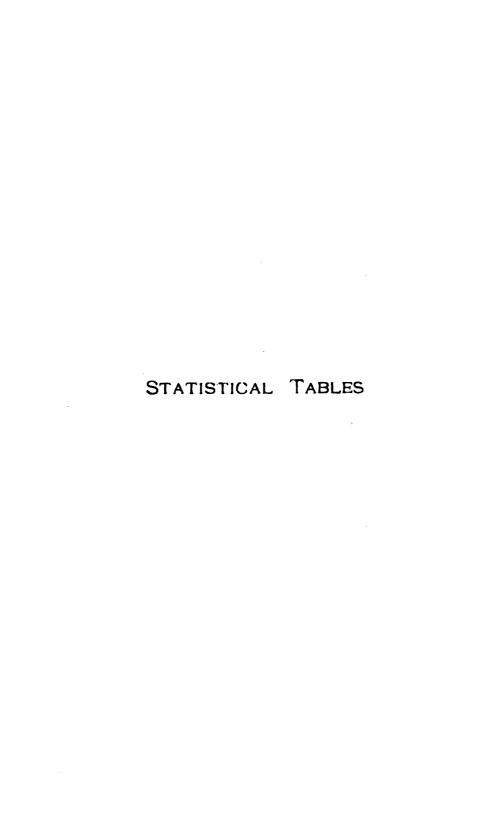
In replying to the deputation Earl Carrington said he could not

The President's Reply.

help being impressed by the deputation that he had the honour to receive, not only by the size of it and by the vast interests it represented, but also by the simplicity and

moderation with which the speakers had expressed their views. He was glad to notice that there had been only one reason given for the desire of the great and influential deputation-the public interest and the danger to the national flocks and herds. The question had excited profound interest: petitions for and against had poured into the Board of Agriculture, and although the number of petitions expressing the view of the deputation was greater than on the other side, yet petitions had been presented representing great urban communities such as Glasgow, &c., which take another view, and their opinions must be treated with respect. The case for the stock owner had been very ably put, and it was urged that the Government ought not to run any risk of introducing disease. On that aspect of the case, a point which appealed to his mind was the effect it might have upon the small holder of land. He would draw attention to the fact that of late the importation of cattle had greatly increased in number and value. He could give no definite announcement of the attitude of the Government on the subject, but he promised to lay the arguments of the deputation before his colleagues. Fortunately, the Government had in its possession veterinary advice of the very highest character. The question must now come before the Cabinet for their decision. He assured the deputation that the decision would be made absolutely on the merits of the case. It would be considered in all its bearings, as affecting the health and well-being of the live-stock industry, the importance and magnitude of which was realised by the Government.

The deputation then withdrew.



## FISHERY STATISTICS

# STATEMENT of the Total QUANTITY and VALUE of the Fish returned compared with the

		0 - 10 - 10 - 10 - 10 - 10 - 10 - 10 -	North	Coast.	-		East	Coast.		
		1905.		19	04.	1905.		1904.		
		Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	
		Cwts.	£	Cwts.	£	Cwts.	£	Cwts.	£	İ
Brill,						29	65	12	23	l
Soles,						92	217	52	237	1
Turbot,						33	191	30	187	l
Total Prime Fish.						154	503	94	447	
Cod		270	253	311	132	1,225	1.165	1.505	1,234	
Conger Eel,				4	4	88	83	190	106	l
Haddock,		508	241	817	341	299	400	278	280	
Hake.						394	637	262	412	l
Herrings,		13,864	5,366	48,392	10,101	11,033	2,867	4,234	1,546	l
Time						390	395	258	247	l
Mackerel,						١.			١.	
Plaice,		3	3			546	497	681	852	1
Ray or Skate	. ,	•				350	166	231	69	
Sprats,										l
Whiting,		4	7			414	380	707	546	
All other except Shell Fish,	• ;	45	19	115	82	1,132	599	2,065	1,120	
Total, .		14,694	5,889	44,639	10,610	16,025	7,692	10,508	6,859	
SHELL FISH:-		No.		No.		No.		No.		
Crabs,				•		259	1	590	2	
Lobsters, .		105	5			976	60	1,092	47	
Mussels,		Owts.		Owts.		Owts. 610	84	Cwts.	51	
•		No.		No.		No. 378	2	No.		
Oysters,	•	Owte.	•	Owts.	•	Cwts.	2	9,643 Cwta.	42	
Other Shell Fish,		· ·	•	OW US.	•	119	68	182	82	
Total, .		•	5	-	•	•	165	•	924	
Total Value of Fish la	nded, .		5,894		10,610		7,857		7,068	

IRELAND.

as landed on the IRISH Coasts during the month of December, 1905, as corresponding period in 1904.

	South	Coast.			Went	Coast.			T	otal.	
190	05.	19	04.	19	05.	19	04.	19	05.	190	)4
Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity,	Value.	Quan- tity.	Value
Owts.	£	Owts.	£	Cwts.	£	Owts.	£	Cwts.	£	Cwts.	£
4	8							33	- 73	12	2
21	92	24	104	33	139	45	133	146	478	121	47
4	17	1	4	13	63	18	92	50	271	49	20
29	117	25	108	46	202	63	225	229	822	182	78
33	33	18	23	64	31	116	49	1,592	1,482	1,950	1,43
9	4			<b>2</b> 8	3	26	9	125	90	220	1
19	11	2	2	503	242	798	314	1,329	894	1,895	9
263	245	14	17	11	5	15	6	668	887	291	4
1,293	487	1,720	483	437	167	1,180	292	26,627	8,887	50,526	12,4
		3	4	72	37	100	34	462	432	361	2
575	229	1,614	403	4,190	1,567	1,812	737	4,765	1,796	3,426	1,1
2,981	995	134	142	91	83	89	70	3,621	1,578	906	1,0
10	4			40	21	41	15	400	191	272	
649	120	32	10					649	120	32	
121	39	334	114	879	396	640	321	1,418	822	1, <b>6</b> 81	94
143	91	134	70	64	56	226	120	1,384	765	2,510	1,3
6,125	2,375	4,030	1,376	6,425	2,810	5,106	2,192	43,269	18,766	64,282	21,03
No.		No.		No.		No.		No.		No.	
						200	1	259	1	790	
20	1	18	1	70	3	952	35	1,171	69	2,062	1
Cwts. 81	5	Owts.		Owts. <b>3,85</b> 0	138	Cwts. 630	50	Cwts. 4,511	177	Cwts. 1,140	31
No. 10,332	21	No. 6,678	13	No. 125,370	322	No. 53,738	65	No. 136,080	315	No. 70,059	1
Owts. 359	52	Cwts. 375	67	Owte. 1,137	226	Owts. 804	173	Cwts. 1,615	346	Owts. 1,361	3
	79		81		689		324		938	•	6
	2,454		1,457	<b>-</b>	3,499		2,516		19,704		21,6

correction in Annual Returns.

## FISHERY STATISTICS-

## STATEMENT of the Total QUANTITY and VALUE of the Fish returned compared with the

		North	Coast.			East	Coast.	
_	19	1906.		1905.		1906.		06.
	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan-	Value.
The second secon	Cwts.	£	Cwts.	£	Cwts.	£	Owts.	£
Brill,					32	84	16	33
Soles,					54	204	28	130
Turbot,				.	20	148	32	203
Total Prime Fish, .		<b>-</b>	-		106	436	76	386
Cod,	. 189	158	244	85	1,375	1.113	1,619	1.165
Conger Eel,	. 3	3			99	105	178	104
Haddook,	. 301	177	422	239	223	302	175	181
Hake,					355	592	222	368
Herrings, .	. 803	551	5,755	1,808	1,844	444	16	14
Ling,	. 3	2		•	347	346	341	347
Mackerel,	. 3	1						
Plaice,	. 3	2	4	3	445	474	449	583
Ray or Skate,	. 5	1	2	1	274	147	234	106
Sprate								
Whiting,			34	30	363	338	631	452
All other except Shell Fish,	. 35	49	43	21	1,268	676	1,060	601
Total, .	. 1,345	944	6,504	2,187	6,699	4,973	5,001	4,287
SHELL FISH :-	No.		No.		No.		No.	
Crabs,	• 366	3	NO.	,	No. 110	1	290	1
Lobsters,	. 140	7			565	<b>3</b> 3	1,084	52
Mussels,	Cwts.		Cwts.		Cwts. 1,525	70	Owta. 749	78
Oysters,	No.		No.		No. 14,868	46	No. 31,311	75
Other Shell Fish	Cwts.		Cwts. 12	2	Owts. 1 <b>3</b> 6	67	Cwts. 169	66
Total, .		10	•	2		217	•	267
Total Value of Fish landed	, .	954		2,189		5,190	•	4,554

IRELAND.

as landed on the Irish Coasts during the month of January, 1906, as corresponding period in 1905.

	South	Coast.			West	Coast.			T	otal.	
19	06.	19	05.	19	06.	19	05.	19	106.	19	05.
Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	V <b>a</b> lue.	Quan- tity.	Value.	Quan- tity.	Value.
Owts.	£	Owts	£	Owts.	£	Owts.	£	Cwts.	£	Cwts.	£
		2	8		•			32	84	18	41
10	38	12	52	57	321	79	352	121	563	119	534
•			•	18	80	19	101	38	228	51	307
10	38	14	60	75	401	98	456	191	875	188	882
19	28	32	38	112	52	292	129	1,695	1,351	2,187	1,417
				68	26	19	. 8	170	134	197	112
8	4	. 8	6	585	261	577	327	1,117	744	1,182	758
1	1			50	20	9	3	406	613	231	371
901	299	1,197	313	88	26	496	142	3,636	1,320	7,464	2,277
7	7	3	3	197	103	102	52	5 <b>54</b>	458	446	402
461	164	214	48	3,687	1,558	1.818	818	4,151	1,723	2,032	866
124	100	101	91	475	404	372	336	1,047	980	926	1,013
14	4			110	25	75	16	403	177	311	123
148	30	31	8	77	34			225	64	31	8
10	10	163	61	974	748	713	336	1,347	1,096	1,541	879
87	50	79	<b>6</b> 5	66	55	150	145	1,456	830	1,332	832
1,790	735	1,842	693	6,564	3,713	4,721	2,768	16,398	10,365	18,068	9,935
No.		No.		No.		No.		No.		No.	
•	•	•		. !	. !	• ;		476	4	290	1
12	1	48	3	902	51	582	24	1,619	92	1,714	79
Owts. 131	8	Cwts.		Owts. 3,778	269	Owis. 538	44	Cwts. 5,434	347	Cwts. 1,287	117
No. 13,482	27	No. 6,720	14	No. 15,845	29	No. 22,987	27	No. 44,195	102	No. 61,018	116
Uwts. 420	74	Cwts. 355	54	Cwts. 1,209	245	Cwts. 1,100	200	Cwts. 1,765	386	Owts, 1,636	322
	110		71		594	•	295	. !	931	.	635
	845		764		4,307		3,063		11,296		10,570

correction in Annual Returns.

## FISHERY STATISTICS-

STATEMENT of the TOTAL QUANTITY and VALUE of the FISH returned as compared with the

		North	Coast.		East Coast.				
	190	1906.		15,	1906.		1905.		
	Quan- tity.	Value.	Quan- tity.	Value	Quan- tity.	V <b>a</b> lue.	Quan- tity.	Value.	
n (1), Auguspun minimika in hinakusakupunas sasakusakusakus (MF - 1987) (1987) in kusakus	Cwts.	£	Owts.	£	Cwts.	£	Owts.	£	
Brill,				. 1	29	60	20	26	
Boles,		•		.	45	125	17	49	
furbot					30	231	30	178	
Total Prime Fish,		.			104	416	67	253	
Cod,	42	24	52	32	1,750	1,244	12,306	1,539	
Conger Eel,	1	1	2	2	159	151	418	215	
Haddock,	180	102	147	75	349	404	430	429	
Hake,					461	760	473	785	
Herrings,	19	7	1,111	285	87	25			
Ling,			3	3	- <b>48</b> 5	488	705	705	
Mackerel,			25	10					
Plaice,			1	1	621	695	781	1,096	
Ray or Skate,			17	6	272	162	485	444	
Sprats,									
Whiting,			32	42	669	618	588	513	
All other except Shell Fish, .	15	22	1	1	1,786	910	1,207	676	
Total,	257	156	1,391	457	6,743	5,873	7,460	6,585	
SHELL FISH:	No.		No.		No.		No.		
Crabs,					199	1	460	2	
Lobsters,	. 72	4			809	43	1,198	57	
Mussels,	Cwts.		Owts.		Cwts. 1,046	43	Cwts. 575	74	
Oysters,	No.		No.		No. 18,450	59	No. 26,871	67	
Other Shell Fish, .	Owts.		Cwts.	3	Cwts. 177	69	Owte. 387	136	
Total,		4	-	8		215	•	336	
Total Value of Fish landed	1.	160	<b>.</b>	460	T .	6,088		6,921	

NOTE.—The above figures are subject to

IRELAND.

landed on the Irish Coasts during the Month of February, 1906, as corresponding period in 1905.

	South	Coast.			West	C <b>o</b> ast.		Total.				
190	D <b>6</b> .	19	05.	19	D6.	19	06.	19	06.	190	)5.	
Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Valt	
Owts.	£	Owts.	£	Cwts.	£	Cwts.	£	Cwts.	£	Cwts.		
1	2	1	2	11	14	8	9	41	76	29		
22	72	26	124	59	402	168	1,040	126	599	211	i,	
1	3			8	30	15	57	39	264	45		
24	77	27	126	78	146	191	1,106	206	939	285	1.	
28	<b>3</b> 3	18	25	738	317	249	126	2,558	1,618	2,625	1,	
19	7			61	26	67	26	240	185	487		
1	1	6	7	853	444	616	290	1,383	951	1,199		
				١.		6	4	461	760	479		
493	120	1,293	295	276	90	834	220	875	242	3,238		
28	23	16	19	325	160	291	142	838	671	1,015		
10	6	712	243	8	3	830	326	18	9	1,567		
193	179	2 <b>23</b>	184	1,012	957	599	591	1.826	1,831	1,604	1,	
20	7	3	1	42	9	130	38	334	178	635		
		18	5							18		
33	18	44	15	770	417	577	419	1,472	1,053	1,241		
<b>13</b> 8	93	107	65	287	197	176	170	2,226	1,222	1,491		
987	564	2,467	985	4,450	3,066	4,566	3,458	12,437	9,659	15,884	11,	
No.		No.		No.		No.		No.		No.		
•	•			١.				199	1	460		
24	2	190	11	1,505	69	5 <b>2</b> 2	24	2,410	118	1,910		
Cwts.		Cwts.		Owts. 2,817	195	Owts. 508	41	Cwts. 3,863	238	Owts. 1,083		
No. 4,200	11	No. 7,182	14	No. 21,766	41	No. 63,183	75	No. 44,416	111	No. 97,236		
Cwts. 520	116	Owts. 408	50	Cwts. 1,051	199	Cwts. 1,116	194	Cwts. 1,748	384	Owts. 1.929		
	129		75		504		334		852	•		
	693		1.060	<u> </u>	3,570	·	3,792	<del></del>	10,511		12	

correction in the Annual Returns.

STATEMENT of the TOTAL QUANTITY of FISH landed on the English and Welsh Coasts during the Month and Two Months ended 28th Feb., 1906, compared with the corresponding Periods of the Year 1905.

					Febr	uary.	Two <b>Mo</b> 28th <b>F</b>	nths ended ebruary.
1					1906.	1905.	1906.	1905.
CONTROL OF THE SECOND OF SECONDARY			andrews for twee square right (i.e. i.e.		· · · · · · · · · · · · · · · · · · ·	QUA:	TITY.	
Brill.					Cwts.	Cwts.	Owts.	Owts 4.399
Soles,	•.	•••	•••	•••	1.687	2,224	3,417 9,626	10,226
Turbot.	•••	•••	•••	••	4,178 4.604	5,232 5,273	11,124	11,060
Other Pri	 ma Fiab	•••	•••	••	P00,P	0,213	11,122	11,000
Other I'll			•••	•••				
	Tot	al Pri	me Fish	• •-	10,469	12,729	24,167	25,685
Bream,	••	•••	•••		1.801	1,814	5,7 <b>66</b>	5,017
Catfish,	•••	•••	•••	•••	3,433	2,471	5,911	3,539
Coalfish,	•••	•••	•••	•••	11,093	7,340	19,701	12,571
Cod,	•••	•••	•••		182,552	129,025	339,941	206,891
Conger Ec	ds,	•••	•••		3, <b>59</b> 5	5,349	6,707	9,138
Dabs,	•••	•••	•••	•••	8,416	8,623	17,409	15,931
Dogfish,	•••		•••	•••	1,656	1,800	6,004	4,947
Dory,	•••				110	281	223	527
Flounders	,				934	-	1,390	_
Gurnards,	•••				6,600	8,196	14,483	14,644
Haddock,	•••				167,917	149,691	352,923	286,216
Hake,	•••	•••		•••	24,324	22,312	38,725	41,759
Halibut,	•••	•••	•••		3,109	8,917	6,427	6,669
Latchets (	Tubs),	•••	•••	•••	62		142	
Lemon Sol	les,		•••	•••	3,076	3,115	5,829	5,501
Ling,	•••	•••	•••	•••	11,663	12,593	23,355	20,955
Megrims,	•••	•••	•••	•••	3,266	2,694	8,382	6,391
Monks (or	Angler	<b>8</b> ),	•••	•••	3,564	3,559	7,836	6,849
Mullet (Re	ed),	•••	•••		85	156	146	352
Plaice,	•••	•••	•••		45,059	49,421	111,902	118,487
Pollack,	•••	•••	•••	•••	1,114	971	1,759	1,491
Skates and	Rays,	•••	•••		26,380	29,435	53,083	58,082
Torsk,	•••	•••	••		543	608	1,208	1,218
Whiting,	•••	•••	•••		27,676	25,454	60,039	53,769
Witches,	•••	•••	•••	•••	2,144	2,856	6,008	5,942
Mackerel,	•••	•••	•••	•••	115	220	1,828	6,214
Mullet (Gr	ay),		•••		45	-	330	
Herrings,	•••	•••	•••	••.	8,998	20,260	10,155	23,585
Pilchards,	•••		•••		-	60	14	831
Sprats,	•••	•••	•••		3,258	4,396	14,866	24,759
Whitebuit	,		•••	•••	648	'	1,171	-
Fish, all of	her, ex	cept 8	hell Fish	1,	24,440	20,713	44,854	39,052
	Tot	al.	•••		588,145	530,009	1,192,674	1,007,012
GL all 702.1		,	•••			<del></del>		
Shell Fish					No.	No.	No.	No.
Crabs,	***	•••	•••	•••	167,549	175,257	306,690	255,831
Lobsters	•	•••	•••	•••	16,536	20,010	25,422	29,732
Oysters,	•••	••	•••	•••	3,530,290	2,966,050	7,274,930	6,889,450
Other of	11 724 - 1	<b>.</b>			Owts.	Cwts.	Cwts.	Owts.
Other Si	1611 F 181	п,	•••	•••	41,957	30,254	87,347	66,177

NOTE.—The figures for 1906 are subject to correction in the Annual Returns.
Flounders, Latchets (Tubs), Mu'lets (Gray) and Whitebait, were not separately distinguished in 1905.

STATEMENT of the TOTAL VALUE of Fish landed on the English and Welsh Coasts during the Month and Two Months ended 28th Feb., 1906, compared with the corresponding Periods of the Year 1905.

					Febi	ruary.	Two Mon 28th Fe	ths ended bruary.
					1906.	1905.	1906.	1905.
						VAI	UE.	
Brill.			•••		£ 5,555	6,470	£ 10.637	12,544
Soles.			•••	1	35,202	34,250	73,771	68,644
Turbot.	•••	•••	•••		22,988	22,585	48,370	44,886
Other Prin			•••			22,000		<del></del>
			me Fish	-	63,745	63,305	132,778	126,074
Bream.		•••	•••		885	798	2,342	2,084
Catfish.	•••			•••	1,983	1,410	3,199	2,039
Coalfish.					5,013	2,613	8,460	5,155
Cod.		•••		••• 1	133,333	88,027	242,116	151,435
Conger Ee		•••	•••		3,064	4,168	5,817	•
Dabs.		•••			8,675	7,877	17,520	7,324 14,252
Dogfish,			•••		605	464	1,748	
Dory.			•••		114	183	208	1,387 <b>4</b> 67
Flouders.				)	561		805	401
Gurnards,		•••	•••		2,363	2,645	4,835	E 75H
Haddock.		•••	•••	•••	135.803	133,158	273,443	5,157
Hake.	•••	•••		•••	26,238	21,980	42,120	252,129
Halibut,	•••	•••	••		11,829		23,421	42,710
Latchet (T			••	!	50	13,228		23,206
Lemon Sol		•••	•••		9,553	8,257	124 18,573	15 500
Ling.				1	8,135	, ,		15,530
		•••	•••		2,772	9,661	16,237	16,297
Megrims, Monks (or	 Amelos	•••	•••	•••		2,240	6,895	4,903
Mullet (Re	_	•	•••	•••	1,608	1,587	3.280	2,987
,		••	•••	•••	201	283	348	777
Plaice, Pollack.	•••	•••	•••		63, <b>68</b> 2 722	64,059	148,476	144,528
	···	•••	•••	•••	· j	666	1,169	1,023
Skates and	-		•••	•••	18,840	19,014	36,364	37,095
Torsk,	•••	•••	•••	••• :	298	297	636	633
Whiting,	•••	•••	•••	•••	17,184	14,793	33.984	31,536
Witches,	•••	•••	•••	•••	3,603	3,181	8.727	6,823
Mackerel,		•••	•••	•••	7,987	17,370	9,698	21,595
Mullet (Gr		••	•••	•••	76		475	
Herrings,	•••	•••	••	•••	52	122	986	3,757
Pilchards,		•••	•••	•••		22	3	170
Sprats,	•••	•••	•••	•••	781	751	3,021	3,736
Whitehait,		•••	***	. "	648		1,171	
Fish, all ot			oneu Fis	Π,	14,931	11,288	25,157	21,081
	To	tal,	•••	•-  -	545,224	493,447	1,074,136	945,840
Shell Fish				1	_	_		
Crabs,	•••	•••	•••	•••	2,120	2,074	3,748	3,189
Lobsters,		•••	•••		944	1,019	1,483	1,499
Oystors,	•••	•••	•••		10,766	8,860	21,993	18,638
Other Sb	ell Fis	h,	***		8.731	7,042	17,162	14,758
Te	otal,	•••	***		22,561	18,995	44,386	38,084
			all Fish	-		512,442	1,118,522	

NOTE.—The figures for 1906 are subject to correction in the Annual Returns.
Flounders, Latchets (Tubs), Mullet (Gray), and Whitebalt were not separately distinguished in 1906.

STATEMENT of the TOTAL QUANTITY and VALUE of the FISH returned as landed on the Scottish Coasts during the Month and Two Months ended 28th February, 1906, compared with the corresponding periods of the Year 1905.

	•		İ	Febru	ary.	28th Fe	hs ended bruary.
				1906.	1905.	1906.	1905.
					QUAN	T <b>IT</b> Y.	
()				Cwts.	Owts.	Cwts.	Owts.
	••	•••		46 418	47 515	817	86,552 86,552 5,358 10,577 139,1739 380,864 2,893 14,773
Cod	••	•••		58,814	515 49,565 3,922 6,436 77,881 1,051 245,709 10,102 7,022 9,175 9,175	109,316	86,552
Conger Eel, Flounders, Plaice, E		•••	•••	4,383	3,922	6,130	5,358
Haddock,	<b>P</b> 111,	•••		6,172 70,586	77 881	10,368 145,329	190,577
	•••	•••	:::	1 997	1,051	2,137 288,851	1'789
		•••		186,966	245,709	288,851	380,464
Lemon Soles,	••	•••		1,512 11,762	10,102	3,080 17,076	14 778
Mackerel,	•••	•••		168	10,102	1,928	14, 194
Ling, Mackerel, Saith (Coal Fish), Skate and Raya	•••	•••	:::	10,147	7,022	20,008	11,818 15,505
Skate and Rays,	•	•••		9,363 184	9.175	15,172 296	15,503
Torsk (Tusk),	•••	•••	•••	781	503	1,161	1,167
Whiting, Fish not separatel		···	hod	11,747	16,136 6,378	26,169	31,142 13,167
except Shell Fis	h.	HIN ATE	uou,	6,279	0,378	14,066	18,167
Total	ι,	•••	•••	<b>3</b> 80 <b>,62</b> 5	436,274	662,000	716,602
Shell Fish :			}-	No.	No.	No.	No.
Orabs,	•••	•••	•••	75 971	107,860 20,988 27,700	197,458	191,886 54,840 52,450
	•••	•••	•••	21,292 27,680	20,988	74,131 59,950	54,840
Oysters,	•••	•••	***				
Clams	•••			Cwts. 1,256	Cwts.	Cwts. 2,300	Cwts.
Mussels		•••		11.067	1,076	23,406	2,134 18'914
Other Shell Fish	,	•••		4,803	6,097	8,001	9,910
					VAL	UE.	
				£	£	£	£
	•••	•••		58 1,489	119	120 2.922	159 8,879
	•••	•••		30 376	24.804	58,635	46,966 2,611 13,704 96,682 3,805 87,529
Conger Eel.	•••	•••		2.305	1,909	3,192	2,611
Flounders, Plaice, Haddock,	Brill,	•••		2,305 7,710 48,357	24,804 1,909 8,038 51,085 2,080	13,585 99,432	98 682
				2,775	2'080	4,516 98,381	3 805
Herrings,	•••		:::	57.627	48,922 3,230	98,381	87 529
Lemon Soles,	••• ••• •••	•••		3,762 5 219	8,230 4 180	7,364 7,516	6,656 6,278
Mackerel	•••	•••	•••	5,219 103	4,189 29 1,678 3,040	7,516 1,256 4,927 6,202 60	
Saith (Coal Fish)	••	•••	•••	2,416 3,820 37	1,678	4,927	2,990
Skate and Rays,	•••	••		3,820	3,040	60	0,498
Sprats, Torsk (Tusk),		•••	•••	258	55 172	378	2,996 5,493 200 317 18 176
Whiting,	•••		•••	6.715	6.774	13,546	18 176
Fish not separate except Shell Fis	ly dist h.	lingui	shed,	4,706	4,021	11,050	10,009
Tot	al,	•••	•••	177,728	162,661	333,112	<b>80</b> C,068
Shell Fish:-							
Crabs,	•••	•••	•••	406 1,305	1 542	1,141 4,210	926 3,283 208 308
Lobsters, Oysters,	•••	•••	•••	1,305	1,286 1,286 108	241	20s
Clams,	•••	•••	•••	185	153 513	342	ŞŎ
Mussels, Other Shell Fish	···	•••	•••	668 1,291	1,290	1,366 2,210	1,184 2,16
Total,	•••	•••	•••	3,969	3,829	9,510	8,060
Total Valu	e of Fi	ah lan	ded.	181,697	166,490	342,622	308,128

NOTE.—The above figures are subject to correction in the Annual Returns.

STATEMENT of the TOTAL QUANTITY and VALUE of the Fish returned as landed on the Irish Coasts during the Month and Two Months ended 28th February, 1906, compared with the corresponding Periods of the Year 1905.

					Feb	ruary.	Two Mont 28th Feb	hs ended cruary.
				ļ	1906.	1905.	1906.	1905,
						QUAL	TTTY.	
					Owts.	Cwts.	Owts.	Owts.
Brill, Soles.	,•••	•••	•••	•••	41 126	29 211	73 247	330
Turbot,		•••	•••	:::	39	45	77	96
Tota	al Prin	ne Fish	,		206	285	397	478
Cod,		•••			2.558	2,625	4.253	4,812
Conger Ee	1,				240	487	410	
Haddock,		•••	•••	•••	1,383	1,199	2.500	2,381
Hake. Herrings,	•••	•••	•••	•••	461 875	3,238	867 4,511	2,381 710 10,702
Ling,	•••	•••	•••	:::	8 <b>3</b> 8	1,015	1,392	1.461
Mackerel,			•••		18	1,567 1,604	4,169	1,461 8,599
Plaice,		•••	•••	•••	1.826	1,604	2,873	2,580 946 49
Ray or Ske		•••	•••	•••	334	i exp	737	946
Sprats, Whiting,	•••	•••	•••	•••	1,472	1,241	225 2.819	2,782
Fish not except s	sep <b>ar</b> a	tely di	stingui	hed.	2,226	1,491	3.682	2,828
Tot		•••	•••	•••	12,437	15,884	28,835	33,952
Shell Fish	:				No.	No.	No.	No.
Crabs,		•••	•••		199	No. <b>460</b>	675	750
Lobster		•••	•••		2,410	1,910 97,286	4,029	3,624 158,254
Oysters	١,	•••	•••	•••	44,416	97,286	88,611	158,254
Mussel	<u></u>		•••		Cwts. 3,863	Owts. 1,083 1,929	Cwts. 9,297	Cwts. 2,370 3,565
Other S	nen F	ish,	•••		1,748	1,929	3,513	3,565
						VA	L <b>U</b> E.	
Ī					£	£	£	£
Brill,		•••	•••		76	37	160	78
Soles.	•	•••	•••	•••	599	1,213 235	1,162	1,747 542
Turbot,	•••	••	•••		264	235	492	542
Tot	al Prir	ne Fish			939	1,485	1,814	2,367
Cod,	•••				1,618	1.722	2,969	3,139 355 1,554 1,160 3,077 1,271 1,445
Conger Ee Haddock,	1,	•••	•••	•••	185	1,722 243 801	319	7355
Haddock,		•••	•••	•••	951	801	1,695	1,554
Hake, Herrings,	•••	•••	•••	•••	760 242	789 800	1,373 1,562	1,150
Ling,	•••	•••	•••	•••	671	869	1,129	1,27
Mackerel,	•••	•••	•••		9	869 579 1,802	1,732	1,445
Plaice,		•••	•••	•••	1,831	1,802	2.811	
Ray or Sk	aic,	•••	•••	•••	178	459	355	612
Sprats, Whiting,	• • •	•••	•••	•••	1.053	989	2,149	81 882 (
Fish not except s	separa	tely d	isti <b>ng</b> ui	sbed,	1,222	912	2,052	1,868 1,744
Tot		•••	•••	•••	9,659	11,485	20,024	21,420
Shell Fish	:							
Crabs,	•••	•••	•••	•••	1	2	5	8
Lobster	re,	•••	•••	•••	118	192	210	171 272 232
Oystere Mussel	5, A	•••	•••	•••	111 238	156 115	218 585	272
Other 8	hell F	ish,	•••	•••	384	383	770	705
l	Total,	•••	•••	•••	852	748	1,783	1,383
Total V	alue o	f Fish l	[anded,	•••	10,511	12,233	21,807	22,803
Non	·	he flore	en fon 1	·	1	correction in	4h - 4mm 1 Ti	- 4

SUMMARY OF QUARTERLY AVERAGE PRICES for each Province and for the Whole of Ireland of Crops, Cattle, and Sheep, and other AGRICULTURAL PRODUCE for the QUARTER ended 31st DECEMBER, 1905, and for the Whole of Ireland for the corresponding QUARTER of 1904.

		Prov	VINCE.		Whole	Whole of
Produot.	Leinster.	Munster	Ulster.	Con- naught.	Ireland,	
CROPS :	s. d.	s. d.	8. d.	s d.	s. d.	s. d.
Wheat, per 112 lbs.	7 0	6 5	_	_	6 10	7 23
White Oats,,	6 2	6 41	2 84	6 53	5 11	5 101
Black Oats, . "	5 92	5 41	-	-	5 5	4 114
Barley, Potatoes,	7 0	7 1 2 54	2 2	6 91	7 0	7 24
War. "	2 31 3 84	2 5\frac{3}{4} 2 7\frac{3}{4}	2 2 2 2 7	1 81 2 21	2 31 3 31	2 81 3 01
Grass Seed (Per-	3 02	2 /3	2 1	2 20	3 34	3 05
ennial Rye),		_	9 89	-	8 <b>3</b> ∮	8 8‡
(Îtalian Rye), ,		_	13 4	_	13 4	9 91
Flax, . per 14 lbs.	-	_	6 94	-	6 93	7 0
STORE CATTLE :	£ s. d.	£ s. d.	£ s. d.	£ 8. d.	£ s. d.	£ s. d.
One year old, per head,	7 5 10	7 5 9	5 11 3	6 13 7	6 16 10	7 7 3
Two years old, "	10 4 9	9 18 8	7 18 9	9 3 5	9 12 0	10 5 11
Three years old, "	12 18 7	12 19 3	•7 6 1	10 17 6	11 14 8	12 11 0
Springers "	14 11 7	13 7 8	12 16 5	13 15 11	13 8 10	13 17 0
STORE SHEEP:-						
Lambs, per head,	1 12 11	1 10 6	0 11 2	189	193	185
Over 12 & under 24 months old, ,,	1 15 11	2 6 7	1 2 5	219	2 2 4	2 1 2
Two years old	1 16 8		108	271	261	269
and upwards, "	1 10 0		100		2 0 1	
MISCELLANEOUS:	в. d.	s. d.	s. d.	s. d.	s. d.	н. d.
BUTTER, . per 112 lbs.	105 5 <del>1</del>	107 <b>0</b> 1	102 94	101 31	106 94	97 44
Eggs, per 120,	12 81	10 113	<u> </u>	10 6	11 10}	10 2
PORK, . per 112 lbs.	48 3	49 84	48 34	47 114	49 24	40 3
BEEF,	-	-	-		49 57	51 0
MUTTON, . "	_			-	60 41	61 24
WOOL, per lb.	0 104	0 11		-	0 104	0 10
-		İ			-	•

<sup>\* 3</sup>rd Class.

STATEMENT showing the WEEKLY AVERAGE PRICES of WHEAT, OATS, and BARLEY per 112 lbs., computed from Market Returns of certain quantities of these Cereals supplied to the Department of Agriculture and Technical Instruction for Ireland by Inland Revenue Officers, during the QUARTER ended 31st DECEMBER, 1905.

Ret	1 Pna			WHEAT.			OATS.	BARLEY.			
	ved in	d	Pric	rage e per lbs.	Quantity.	Average Price pe 112 lbs.	Quantity.	Average Price per 112 lbs.	Quantity.		
19	05.		ж.	d.	Owts. of 112 lbs.	s. d.	Owts. of 112 lbs.	s. d.	Cwts. of 112 lbs,		
Octob	er 7,		6	8	915 <u>}</u>	5 44	34,549}	7 21	27,9334		
••	14,		6	84	1,4221	5 51	26,210	6 113	9,8584		
٠,	21,		6	72	703}	5 63	16,512 <b>1</b>	7 0	12,540		
**	28,		7	24	947 <u>1</u>	5 71	21,410	6 94	4,8884		
Nov.	4,		6	102	576à	5 9	11,0707	6 61	738		
••	11,		6	104	<b>36</b> 8	5 104	14,0934	6 3	492		
**	18,		6	111	3804	5 10	9,398‡	6 3	208		
**	<b>25</b> ,		7	0	7982	5 10	10,865‡	6 41	160		
Dec.	2,		e	81	2783	5 11	11,205	6 4	238		
"	9,		6	9	305	5 101	12,083	6 04	286		
1,	16,		6	112	305	5 112	8,819	6 3	200		
**	23,		6	4	75	5 114	8,7802	6 3	120		
**	<b>30</b> ,		6	4	74	5 113	3,8634	-	_		

TABLE showing the AVERAGE PRICES per 112 lbs., LIVE WEIGHT, of FAT CATTLE and FAT SHEEP sold in the DUBLIN MARKET during the QUARTER ended 31st DECEMBER, 1905, and also for the corresponding period during the eight preceding years.

Dwagnener		YEAR.																
DESCRIPTION.	19	05	18	04.	18	03.	19	02.	19	901.	18	<b>0</b> 00.	18	<b>199</b> .	18	398.	18	97.
	8.	d.	8.	d.	8.	d.	6.	d.	8.	d.	s.	d.	8.	d.	8.	d.	8.	đ.
Fat Cattle . Fat Sheep, .	28 34	3 <u>1</u> 6	i .		Ι.	42 10	ı			11} 2}	ì		ł	7# 41	27 31	84 5	28 32	14 7

STATEMENT showing the NUMBERS of CATTLE and SHEEP in respect of which "LIVE WRIGHT" Returns have been furnished to the Department of Agriculture and Technical Instruction for Ireland, as under, during the Quarter ended 31st December, 1905.

Total	Number of Sheep included in Returns.	312	200	282	33	162	992	252	338	249	301	342	103	\$	3,070
Numbers included in Returns of Live Weight of Fat Sheep furnished by	Mr. Gavin Low (Dublin).	312	180	282	325	132	226	262	323	223	186	297	103	3	2,886
Numbers includ Live Weight furnis	Dublin Corporation Market Authorities.		20	1	14	88	53	ı	15	20	16	97	ı	1	181
Total	Number of Cattle included in Returns.	362	365	336	260	305	291	268	307	488	255	211	152	231	3,739
Numbers included in Returns of	of Store Cattle furnished by Official Reporters of Prices.	8	ı	1	ı	83	72	ı	1	135	ı	ı	ł	ı	278
f Live Weight of d by	Mr. Gavin Low Mr. John Robson (Dublin). (Belfast).	15	15	16	20	æ	17	77	. 22	17	83	13	11	22	926
Numbers included in Returns of Live Weight of Fat Cattle furnished by	Mr. Gavin Low (Dublin).	170	163	219	167	771	143	171	88	2003	130	137	7.5	110	2,142
Numbers inclu Fs	Dublin Corporation Market Authorities.	81	87	102	83	61	101	73	<b>5</b> 6	<b>3</b> 5	103	19	19	62	1,083
		•	•	•	•	•	•	• ,	•	•	•	•	•		•
	Week ended	October 7	. 14, .	. 21.	. 88	November 4,	· 'H "	. 18, .		December 2, .	oi :	16,	a	8	Totala, .

#### DISEASES OF ANIMALS IN IRELAND.

NUMBER of OUTBREAKS of SWINE-FEVER, and Number of SWINE returned as having been SLAUGHTERED in Ireland, under the Diseases of Animals Act of 1894, in the undermentioned period, by Order of the Department.

	Swine-Fever.				
Quarter ended	Outbreaks confirmed.	Swine Slaughtered as Diseased or as having been Exposed to Infection.			
30th December, 1905,	3	18			

Number of Outbreaks reported as having taken place, and Number of Animals returned as having been attacked by Anthrax and Glanders in Ireland in the undermentioned period.

0	ANTI	IRAX.	GLAN (includin		Epiz <b>o</b> ot <b>ic</b> Lymphangitis.		
Quarter ended	Outbreaks Reported.	Animals Attacked.	Outbreaks Reported.	Animals Attacked.	Outbreaks Reported.	Animals Attacked.	
36th Dec., 1905, .	1	1	13	52		~	

## NUMBER of Cases of RABIES in DOGS in IRELAND during the undermentioned period.

G	)u <b>art</b> er	ended				Number of Cases.
30th December, 1905,	•	•	•	•	•	

NUMBER of OUTEREAKS reported as having taken place, and NUMBER of ANIMALS returned as having been attacked by SHEEP-SCAB and PARASITIC-MANGE in Ireland in the undermentioned period.

	SHEEP	-SCAB.	Parasitic-Mange.				
Quarter ended	Outbreaks Reported.	Sheep Attacked.	Outbreaks Reported.	Animals Attacked.			
30th December, 1905, .	101	1,147	14	24			

Veterinary Branch,
Department of Agriculture and Technical Instruction for Ireland,
Dublin.

BUTTER PRICE

## ABSTRACTED FROM "THE GROCER," "GROCER'S

The quotations are Landed Prices of the Choicest Qualities. The Nett F.O.R. Price to an Irish

			:	WEEK	endi <b>n</b> g-	
COUNTRY OF ORIGIN.	Type of Package.	Place of Sale.		JAN	UARY.	
ORIGIN.			6th.	18th.	20th.	27th.
			Per cwt.	Per cwt.	Per cwt.	per owt.
IRELAND-			8. 8.	8. 8.	8. 8.	8. 8.
Creamery Butter,	Kiels, kegs, or	London,		_	_	
	pyramid boxes,	Liverpool,	_	-		-
		Bristol,	-	-	-	-
		Cardiff,		126	-	-
		Manchester,	-	-	-	-
		Birmingham,	-	_		-
		Glasgow,	-	-	-	-
		Limerick,	-	-	_	-
		Cork,	-	_	-	-
		Belfast	-	-	-	-
		Dublin,	-	_	-	-
	l lb. rolls, 54 lb. boxes.	F. O. R.,	130/10	127/4	120/4	121/6
Factories,	OOXES.	London,	105-109	107-109	102-108	102-108
		Manchester	_	_	104-106	_
		Cardiff,	_	-	_	_
		Bristol,	_			_
Farmers' Butter,	Firkins, 1st,	Cork	106	109	112	100
	Do. 2nd	_	99	103	109	103
	Do. 3rd	-	92	94	92	92
	Fresh,	Cork,	96-108	100-110	102-116	97-114
FRANCE,	12×2 lb. rolls,	London,	Per doz. lbs. 13/1 to 15/6	Per doz. lbs. 12/- to 13/6	Per doz. lbs. 12/- to 14/6	Per doz. lbs. 12/- to 14/6
	Paris baskets,	d <b>o.,</b>	Per ewt. 118-127	Per cwt. 114-118	Per cwt. 114-118	Per cwt. 114-118
DENMARK AND SWEDEN.	Copenhagan	Quotation,	104 Kr. 116/10 per per 50 cwt. Kilo.	101 Kr. 113/5 per = per 50 cwt. Kilo.	95 Kr. 106/8 per = per 50 cwt. Kilo.	95 Kr. 106/8 per = per 50 cwt. Kilo.
l		Average overprice,	6/2	6/7	7/-	7/5
:	Kiels,	London,	126-129	124 126	116-120	117-190
1		Liverpool,	130-132	131-134	124-128	120-123
l	}	Cardiff	125-132	133-134	127-129	191-128
	1	Manchester,	129-132	130-132	120-126	116-118
	İ	Birmingham,	127-129	129-131	122-128	115-122
		Newcastle-on-	127-129	129-131	122-125	116-119
		Tyne. Glasgow,	128-129	129-130	125-126	119-120
		Leith,	128-	130-131	125-126	118-119
	į	Hull,	120-125	127-130	140-140	128-125
	1 lb. rolls, 10×24 lbs. boxes.	F. O. R. London,	130/8	127/2	120/2	121/4
INLAND	Kiele,	Manchester,	122-126	124-128	116-121	112-115
		Liverpool				110-114
	1	- 1			1	
	1	Hull,	115-120	- 1	1	118-120

STATISTICS.

REVIEW," AND THE "GROCER'S GAZETTE."

Creamery would be 5s. to 7s. per cwt. less. This figure covers commission, freight, handling, &c.

			V	VEEK ENDI	Nu-			
	FEB	RU≜RY.				March.		
Srd.	10th.	17th.	24th.	<b>3</b> rd.	10th.	17th.	24th.	31st.
Per cwt.	Per cwt.	Per owt.	Per cwt.	Per cwt.	Per cwt.	Per cwt.	Per cwt.	Per cw
8. 8.	8. R.	я. я.	8. 8.	s. s.	8. 8.	8. 8.	8. 8.	8. 8
-	! -	-	-	-	_	-	-	_
_		-		-		-	-	-
	_						-	-
-	-	-	-	-	-	-	-	106-11
-		-	_	_	-	_	-	-
-	-	_	_	-	.1 -	_	_	_
_	-		-	_	_	_	_	-
_	_	-	-	_	_	_	_	_
_	_	1 =		_		_	_	_
_	; =	_		_			_	_
116/10	118/-	119/2	120/4	121/6	121/6	122/8	118/-	113/8
100-104	99-102	99-102	96-100	96-99	į	93-96	90-94	1
100-108	19-102	89-102	80-100	שט-טט	93-96	89-80	90-94	89-92 92-98
_		_	_			_	_	78-30
_	_			_	_	_	_	_
107	110	109	1114	113	108	100	95	93
100	100	100	97	101	99	97	86	82
96	88	85	_	83	82	82	76	72
98-106	94-101	_	92-102	92-100	90-103	81-96	77-91	75-95
Per doz. lbs. 12/- tc 15/-	Per doz. lbs. 12/- to 15/-	Per doz. 1bs.	Per doz. 1bs.	Per doz. lbs.	Per doz. lbs. 12/- to 15/-	Per doz. lbs.	Per doz. lbs. 12/- to 15/-	Per doz. 1 12/- to 14
Per owt. 116-120	Per cwt. 116-120	Per cwt. 116-120	Per ewt. 116-120	Per cwt.	Per ewt. 116-120	Per ewt.	Per cwt.	Per owt
91	91	91	91	91	91	91	91	98
Kr. 102/2	Kr. 102/2	Kr. 102/2	Kr. 102/2	Kr. 102/2	Kr. 102/2	Kr. 102/2	Kr. 102/2	Kr. 110
per - per 50 cwt.	per ≔ per 50 ewt.	per ≔ per 50 cwt.	per per 50 cwt.	per = per 50 ewt.	per per 50 cwt.	per per 50 cwt.	per ≔ per 50 ewt.	per = per 50 cw
Kilo.	Kilo.	Kilo.	Kilo.	Kilo.	Kilo.	Kilo.	Kilo.	Kilo,
7/104	8/4	8/11	9/5	10/1	10/8	11/4	-	Included
112-115	113 115	113-115	114-117	116-118	117-120	117~120	117-119	112-115
118-122	117-120	118-120	120-122	121-123	123-125	122 - 124	123-125	120-122
1 <b>90-19</b> 3 117-1 <b>9</b> 0	118-119	118-120	121-122	121-123	123-124	123	122-123	120-122
117-120	114-116 115-118	115-117 116-118	118-120 117-120	120-122 118-121	119-123 119-121	119-123 118-121	120-123 117-121	116-120
117-120	114-117	114-117	116-118	118-121	120-121	120-121	119-121	116-121 116-118
119-120	114-116	114-116	115-117	116-118	117-119	117-119	117-118	116-117
118-119 120-122	115 116–122	116 112-116	116-117 114-116	117-118 1 <b>14-</b> 116	118-119 114-116	119-120 114-116	118-119	119-120
116/8	116-122	119/-	120/2	121/4	121/4	122/6	114-116 122/6	112-114 117/10
114-116 114-116	110-112	112-114	112-116	114-117	115-118	114-118	112-117	110-116
114-118	110-113 114-118	111-114 112-114	114-116 112-114	115-118 112-114	116-118 11 <b>2-</b> 114	11 <b>5</b> -117 112-114	115-117 112-114	112-115
116-118	118-115	116	114-114	118	115	112-119	112-114	110-114
********	***-1TA	****	412	110	110	_	**0	-

BUTTER PRICE

ABSTRACTED FROM "THE GROCER," "GROCER'S

The quotations are Landed Prices of the Choicest Qualities. The Nett F.O.R. Price to an Irish

				WEEK E	NDING-	
COUNTRY OF				JANT	JARY.	
ORIGIN.	Type of Package.	Place of Sale.	6th.	13th.	20th.	27th.
			Per cwt.	Per owt.	Per cwt.	Per cwt.
Russia & Siberia.	Kiels,	London,	8. 8. 108-110	s. s. 108-112	%. *. 106–110	106-108
INCOME OF DEPARTMENT,	ikidis,	Liverpool,	106-110	106-110	106-110	106-108
		Bristol	116-118	114-116	112 114	110-112
		Cardiff	108-112	113		_
		Birmingham,	106-112	106-112	104-110	104-110
		Leith,	110-116	112-116	110-116	106-110
HOLLAND,	Boxes,:	London,	116-120	120	114-120	112-118 Per doz. lbs.
	Rolls,	<b>d</b> o	_	_	-	13/- to 13/6
	Boxes,	Glasgow,   Fresh,	123-125 117-119	125-127 119-121	122-124 118-119	122-124 115-116
	,	Manchester	111-119	125-127	118-119	118-116
		Hull,	_	125-128	-	-
Italy,	Rolls,	London,	Per doz. lbs. 13/- to 14/-	Per doz. lbs. 13/- to 14/-	Per doz. lbs. 12/6 to 13/6	Per doz. lbs. 12/6 to 13/6
Canada,	56 lb. boxes	London,	Per owt.	Per cwt.	Per cwt.	Per cwt. 100-103 D.
		Liverpool,	-	· -	-	-
		Bristol,	100-103 D.	100-103 D.	110-114 C. 100-103 D.	100-103 D.
		Oardiff,	-	_	( 100-1001).	' <b>-</b>
		Birmingham,	-	_	-	-
		Glasgow,		_		-
		Leith,	_			***
AUSTRALIA & NEW	Boxes,	London,	114-120	114-118	110-114	108-113
ZEALAND.		Liverpool,	118-121	118-124	112-120	110-116
		Bristol,	120-122	120-124	118-122	110-118
		Cardiff,	118-122	118-124	116-120	110-118
		Manchester,	118-122	119-122	115-120	112-114
		Birmingham,	116-120	118-122	112-120	110-114
		Newcastle - on - Tyne.	-	-		_
		Glasgow,	_	190-122	115-116	119-115
		Leith,	-	124-126	120-124	114-118
		Hull,	-	114-119	-	116-118
ABGENTINA,	Boxee,	London,	114-116	114-116	110-114	110-119
		Manchester,	-	_	115-117	-
		Liverpool,	118-122	118-122	116-117	113-115
		Bristol,	118-120	118-120	117-119	114-116
		Cardiff,	121	122	115-118	116-116
		Birmingham,	118-121		119-120	114-116
		Glasgow,		120	118	
United States,	Tubs and boxes,	London,	104-108	104-108	102-106	102-104
		Liverpool,	100-106 R.	102-108 R.	102-106 R.	109-107 R.
		Bristol,	105-108 C.	106-108 C.	104-107 C.	104-107 C.
		Cardiff,	-	-	197-109 R.	_

STATISTICS—continued.

REVIEW," AND THE "GROCER'S GAZETTE."

Creamery would be 5s. to 7s. per cwt. less. This figure covers commission, freight, handling, &c.

			W	EEK ENDIN	(G-			
	FEB	RUARY.				MARCH		A MARKET EMBART - ESPAINA AN
3rd.	10th.	17th.	24th.	3rd.	10th.	17th.	24th.	31st,
Per ewt.	Per ewt.	Per ewt.	Per cwt.	Per ewt.	Per ewt.	Per owt.	Per ewt.	Per ewt.
s. s. 102-106	*, *, 102-104	7. s. 102-106	102 106	102-106	×. ×. 100-104	100-104	100-104	100-104
104-108	102-104	100-104	_	102-104	102-104	100 103	100-102	98-100
108-110	107-108	106-108	106-108	-			_	
_	-	_		_	-			96-102
102-108	102-106	102-106	100-106	100-106	100-104	100 -102	96-100	94-100
106-110	106-110	106-110	106 -110	106-110	106-110	106-108	104-106	106-108
114-116 Per doz. lbs.	114-116 Per doz lbs.		116-118 Per doz lbs.	114-116 Per doz. lbs.	114-116 Per doz. lbs.	110-112 Per doz. lbs.	110 112 Per doz. Ibs.	102-104 Fer doz. I
13/- to 14/-	13/ to 14/- 120-122	13/- to 14/- 122-124	13/- 10 14/-	13/- to 14/- 120-122	13/- to 13/6 118-120	12/6 to 13/6	12/6 to 13/- 113-115	12/- to 12
122-124 116-118	114-116	116-118	116 118	116-118	110-112	110-112	110	111-112 104 106
115-117			_	118	117-118	114/6	112-113	110-112
118-123	_	-	_	-		_	118-122	115-119
Per doz. lbs. 12/6 to 13/6	Per dez, lbs. 12/6 to 13/6	Per doz. 1bs. 13/- to 36/6	Per doz. lbs 13/- to 13/6	Perdoz. lbs. 13/- to 14/-	Per doz. lbs. 13/6 to 14/-	Per doz. lbs. 13/6 to 14/-	Per doz. lbs. 13/6 to 14/-	Per doz. 1 13/6 to 14,
Per owt.	Per ewt.	Per cwt.	Per cwt.	Per cwt.	Per cwt.	Per cwt.	Per cwi.	Per cwt
		_		! _	_	ΙΞ		
99-101 D.	98 100 D.	96-98 D.	96 D.	96-98 D.			_	
	00 100 D.	102-104	108-109	104-107 C.	104	102-104	100	_
			-	_	1	_	_	
	-						_	_
			-		_		-	-
104 - 110	102-110	102-108	102-110	102-110	100-110	96-108	98-110	96-110
109-116	105-112	102-111	102-112	104-112	102-110	98-108	96-106	92-10
109-115	108-113	105-112	105-114	105-113	105-111	105 111	98-109	94-10
110-114	106 112	104 108	104-110	104-112	104-109	102-108	95-107	94100
112-115	106-110	105-110	106-110	106-111	104-110	100-108	96-108	94-100
104-116	105-111	102-112	106-108	104-112	100-111	100-110	A 96-100	92-10
-		-	-				-	-
111-114	106-109	108-109	108109	106-108	100-10G	102-108	101-105	100-10
114-117	111-114	110-114	110-114	110-114	110-:14	107-112	107-110	104-10
114-116	112-115	108-114	106-112	108-112	108-112	108-112	108-110	100-10
106-108	106-108	104-108	104-110	105-108	102-110	100-108	96-108	96-100
113-115	107-110	108110	109 110	110-111	108-110	106-108	104-106	102-100
113-116	106-108	105-107	106-108	107-111	106-110	10 <b>3-10</b> 5	100-104	100-10
112-114	106-113	109-111	109-111	109-111	106-109	106-109	102-104	102-108
112-114	111-114	108-110	109-113	109-112	108-110	106-108	104-106	102-100
112-114	109-110	109-111	111-112	110-112	108-110	105-107	103-105	102-104
110-112	106-108	108-110	108-110	105-112	105-110	105-110	105-110	102-106
96-100	94-98	94 98	94-98	92-96	90-94	86-90	84-88	84-85
108-106 R.	98-104 R.	96-104 R	96-103 R.	96-103 R.	92-1:0 R.	92-93 R.	86 96 R.	86- <b>9</b> 6
102-104 C.	99-103 C.	98-100 C.	95-98 C.	95-98 C.	92-95 U.	90-91 C.	88-92	86-9
		-		95	-	. 96	_	٠

### TABLES SHOWING THE EXPORTS

TABLE
RETURN of the Number of Animals Exported from Ireland to Great
Ports of Embarkation

			CATTLE				Shrep.			SWINE		
IRISH PORTS.	Fat.	Stores.	Other Cattle.	Calves.	Total.	She <b>e</b> p.	Lumbs.	Total.	Fat.	Stores.	Total.	
Ballina,	80		202	•	282				19		19	
Belfast,	1,295	38,847		210	40,352	2,683	244	2,927	8,736		8,736	
Coleraine,	3	238			241	206	•	206	72		72	
Cork,	2,248	11,796	1,116	13,888	29,018	7,983	2	7,985	8,870		8,870	
Drogheda, .	9,393	14,479		2	23,874	8,944	. • I	8,944	2,583		2,588	
Dublin,	57,535	47,107	1,064	3,812	109,518	68,792		68,792	85,197		85,197	
Du <b>nd</b> alk,	637	6,903			7, <b>54</b> 0	4,672	•.	4,672	11,626		11,626	
Dundrum (Co. Down).		7			7			•				
Greenore, .	14	9,498		174	9,686	1,287		1,287	1,158		1,158	
Larne,	127	5,247	•		5,374	201		201	66		66	
Limerick,	1.591	162		81	1,784		•					
Londonderry, .	759	12,679	485	3,064	16,987	3,393	572	3,965	3,614		3,614	
Newry,	23	2,105			2,128	768		768	782		782	
Portrush,	18	•			18				74		74	
Sligo,	212	1,258			1,470	2,045	•.	2,045	10,638		10,638	
Waterford, .	<b>5,47</b> 0	17,229	359	2,206	25,264	6,464	.•	6,464	10,518		10,518	
Westport, .	505		305		810	3,753		8,758	2,837	•	2,887	
Wexford, .	524	145		1	<b>67</b> 0	3,298	•	3,298	<b>2,94</b> 5	•	2,945	
Total,	80,484	167,700	3,581	23,388	275,058	114,489	818	115,307	149,235	•	149,236	

## AND IMPORTS OF ANIMALS.

I.

BRITAIN during the Three Months ended 31st DECEMBER, 1905, showing the in Ireland.

			Но	RSES.		Mules		Total	
	Goats.	Stallions.	Mares.	Geldings.	Total.	or Jennets.	Ass <b>e</b> s.	Animals.	IRISH PORTS.
									D. W.
	•	•	•		•		•	301	Ballina.
	7	1	539	1,180	1,720	1	8	53,751	Belfast.
		.	2	•	2		•	521	Coleraine.
	1	5	133	340	478		6	46,388	Cork.
	6		16	18	84			35,441	Drogheda
	7	20	1,216	1,022	2,258	1	9	265,782	Dublin.
	17		62	99	161		1	<b>24</b> ,017	Dundalk.
								. 7	Dundrum (Co. Down),
		4	541	346	891		4	13,026	Greenore.
		2	47	49	98		1	5,740	Larne.
								1,784	Limerick.
	•	4	40	49	93			24,659	Londonderry.
			1	1	2			3,680	Newry.
							1	93	Portrush.
	2		8	6	13			14,168	Sligo.
ĺ	1	10	350	461	821	. 1		43,069	Waterford
								6,900	Westport.
	1		5	13	18			6,932	Wexford.
	-								
	42	46	2,960	3,583	6,589	3	30	546,259	Total.

TABLE
RETURN of the Number of Animals Exported from Ireland to Great
Ports of Debarkation

!		(	JATTLE				SHEEP.		1	SWINE.	
BRITISH PORTS.	Fat.	Stores.	Other Cattle.	Calves.	Total.	Sheep.	Lambs.	Total.	Fat.	Stores.	Total.
Ardrossan, .	145	10,837		60	11,042		•		397		397
A <b>y</b> r,	166	11,040	•	119	11,325	183	•	183	403	.	403
Barrow,	91	1,379	•		1,470	156		156	3,480		3,480
Bristol,	837	8,369	8	2,249	11,463	3,755		3,755	6,171		6,171
Dover,	•	15			15		•				
Falmouth, .	3	2		•	5						
Fleetwood	63	3,057	•	63	3,183	1,268	284	1,552	3,760		3,760
Glasgow,	9,258	33,832	2,602	5,880	51,572	<b>6</b> 20	50	670	9,814		9,814
Greenock,	4	2,547			2,551				18		18
Heysham	1,468	9,335	. •	65	10,868	1,626	•	1,626	13,709		13,709
Holyhead, .	11,244	24,502	26	807	36,579	22,220		<b>22,22</b> 0	56,859		56,859
Liverpool,	42,659	44,179	849	4,089	91,776	71,943	482	7 <b>2,4</b> 25	46,703		46,708
London,		5			. 6		•				
Manchester, .	7,024	389			7,413	8,159		6,159	1,524		1,524
Milford, .	2,081	12,281	46	9,144	23,552	6,337	2	6,339	5,631		5,631
Newhaven, .	1	108			109						
Plymouth, .	1,028	83		658	1,769						
Portsmouth, .										.	
Silloth,	4,123	600			4,723	60		60			
Southampton, .	117	220		254	591	. 20		20	760	3 .	766
Stranraer,	122	4,918			5,086	142		142			
Whitehaven, .		7			7						•
Total,	80,484	167,700	3,58	25,388	275,058	114,486	818	115,807	149,23	5 .	149,285

II.

Britain during the Three Months ended 31st December, 1905, showing the in Great Britain.

		Ho	rses.		Mules		Total	
Goats.	Stallions.	Mares.	Geldings.	Total.	or Jennets.	Авяев.	Animals.	BRITISH PORTS.
	,   .					,		- toning white an order of the party of the state of the
•		55	179	234			11,673	Ardrossan.
		14	43	57		•	11,968	Ayr.
		25	109 :	134		•	5,240	Barrow.
1	3	157	286	446		5	21,841	Bristol.
•	1 :	2	5	8			23	Dover.
		1		i			6	Falmouth.
	1	264	463	718	1	3	9,217	Fleetwood.
2	1	124	195	<b>32</b> 0	1	3	62,382	Glasgow.
1	4	6	8	18			2,588	Greenock.
3		120	180	<b>30</b> 0	,	. 2	26,508	Heysham.
4	24	1,515	1,165	2,70	,	8	118,374	Holyhead.
31		204	333	5 <b>37</b>	1	6	211,479	Liverpool.
		•		•			5	London.
•		54	33	87			15,183	Manchester.
•	10	317	486	813		1	36,336	Milford.
		11	10	21			130	Newhaven.
•		7	7	14			1,783	Plymouth.
	. !	•	2	2		•	2	Portsmouth.
		25	21	46		•	4.829	Silloth.
•	•	13	21	34		1	1,412	Southampton.
•	2	46	47	95		1	5,278	Stranraer.
							7	Whitehaven.
42	46	2,960	3,583	6,589	8	30	546,259	Total.

 ${\bf TABLE}$  Return of the Number of Animals Imported into Ireland from Great Britain of Debarkation

_			CATTLE				Sheep.			SWINE	
IRISH PORTS.	Fat.	Stores.	Other Cattle.	Calves.	Total.	Sheep.	Lambs.	Total.	Fat.	Stores.	Total.
Ballina,					•	2	•	2			•
Belfast,	•	62		6	68	5,151		5,151			•
Coleraine,		•	•			189		189			
Cork,		1		1	2	87	•	87			•
Drogheda, .		1		•	1		•				•
Dublin,	•	12	•	19	31	1,446	70	4,516	1	6	7
Dundalk, .	•		i		٠		•				•
Dundrum, .	٠			•	•	•	•		•		•
Greenore, .	•	4	•	• ;	4		•		•		•
Larne,	•	15		2	17	410		410		•	•
Limerick,	•		. •		•		87	87			
Londonderry, .		2			2	401	435	836	•	1	1
Newry,		1		2	3		•		•		•
Portrush,				•							
Sligo,			•			170		170			•
Waterford, .		; 1			1	237	•	237		3	3
Westport,				: : •	•	224	•	224			
Wexford.				:		7		7			
				-	-	<u> </u>				ļ <u>.</u>	
Total,	•	99		80	129	11,324	592	11,916	1	10	11

111.
during the Three Months ended 31st December, 1905, showing the Ports in Ireland.

		Но	RSES.		Mules		Total	
Goats.	Stallions.	Mares.	Geldings.	Total.	or Jen <b>nets.</b>	Asses,	Animals.	IRISH PORTS.
 					Ì		2	Ballins.
	1	69	173	243		2	5,46 <u>4</u>	Belfast.
		2		2			191	Coleraine.
		61	76	137			226	Cork.
		7	14	21		•	22	Drogheda
•	20	301	256	577		14	5,145	Dublin.
•		٠	6	6	٠	•	6	Dundalk.
•		•		•	٠	٠.	•	Dundrum.
•		22	24	<b>4</b> 6	٠	•	50	Greenore.
٠	1	4	8 .	13			440	Larne.
•	• :	•	•	•			87	Lin erick.
•	•	37	36	72	٠	•	911	Londonderry
•		4	2	6	•	٠	9	Newry.
	•	•	•					Portrush.
٠	•		• ,				170	Sligo.
	6	56	63	125	•		366	Waterford.
	• 1		•	,		·	224	Westport.
	•	2	6	8			15	Wexford.
	28	585	663	1,256	·	16	13,328	Total.

TABLE

RETURN of the Number of Animals Imported into Ireland from Great Britain

Embarkation in

and the second			CATTLE				Sh <b>ee</b> p.			SWINE.	
BRITISH PORTS.	Fat.	Stores.	Other Cattle.	Calves.	Total.	Sh <b>e</b> ep.	Lambs.	Total.	Fat.	Stores.	Total.
Ardroman, .		35	•	4	39	1,711		1,711	•		
Ayr,	•	5	•	•	5	3,424		3,424			
Barrow,											
Bristol, .			•		•	33	5	38			
Cardiff,	•			.	•			.			
Falmouth, .						•		.			
Fleetwood, .	,			.		41		41			
Glasgow,		27		17	44	4,596	424	5,020	•		
Greenock, .			.		.	377	111	488	•		
Heysham, .		2			2	12		12			.
Holyhead, .		6		1	7	77		77		6	6
Liverpool		6		6	12	8	2	10	1	1	2
London,		.			.	.	.	.			.
Manchester, .					. ]			.			.
Milford,					.			.		3	3
Newhaven, .	.	.		.	,			.			.
Plymouth, .		.		.	.			.			.
Silloth,					.	969	50	1,019			.
outhampton,		3	.		3					.	.
trancaer.		15	.	2	- 17	76		76			.
Whitehaven, .				-							
Total,		99		30	129	11,324	592	11,916	1	10	11

IV.

during the Three Months ended 31st December, 1905, showing the Ports of Great Britain.

			Hor	9e8.		Mules		Total	
	Goats.	Stallions.	Mares.	Geldings.	Total.	or Jennets.	Asses.	Animals.	BRITISH PORTS.
			7	22	29		1	1,780	Ardrossan.
			1	9	10			3,439	Ayr.
			2	1	3			.3	Barrow.
			10	21	31	,	1	70	Bristol.
					•				Cardi <b>ff.</b>
	•		1	•	1			1	Falmouth.
		1	45	79	125			166	Fleetwood.
			42	52	124			5,188	Glasgow.
		1	1	3	5			493	Greenock.
	•	,	12	82	44			58	Heysham.
		17	297	219	533		1	624	Holyhead.
		2	30	67	99		13	136	Liverpool.
			•					٠.	London.
			1	2	3			3	Manchester.
		6	63	86	155			158	Milford.
									Newhaven.
			48	27	75			75	Plymouth.
			1	5	6			1,025	Silloth.
		.		1	1			4	Southaniliton.
	,	1	4	7	12			105	Stranraer.
									Whitehaven.
	•	28	6 <b>6</b> 5	663	1,256	•	16	13,328	Total.
_								<u> </u>	

## RETURN of the Number of Animals Exported from Ireland to the showing the Ports of

					CATTLE	G.			Sheep.	
IRISH PORT	8.		Fat.	Stores.	Other Cattle.	Calves	Total.	S <b>hee</b> p.	Lambs.	Total.
BELWAST,			2	40		6	48	86	•	86
DUBLIN,				49			49	24		24
TOTAL,	•	•	2	89	•	6	97	60		60

## RETURN of NUMBER of ANIMALS EXPORTED from IRELAND to the showing the Ports of Debarkation

			CATTLE	SHEEP.				
ISLE OF MAN PORT.	Fat.	St <b>or</b> es.	Other Cattle,	Calves	Total.	Sh <b>ee</b> p.	Lambs	Total.
DOUGLAS,	2	89	•	6	97	60		60

## RETURN of the Number of Animals Imported into Ireland from the showing the Ports of

			DATTLE	i.			SHEEP.	
IRISH PORTS.	Fat.	Stores.	Other Cattle.	Calves	Total.	Sheep.	Lamba.	Total.
BELFAST,	•							
DUBLIN,				•		<u> </u>		
TOTAL,	•		•	•	•		•	

## RETURN of the Number of Animals Imported into Ireland from the showing the Ports of Embarkation

		(	CATTLE	i.			SHEEP		
ISLE OF MAN PORT.	Fat.	Stores.	Other Cattle.	Calves	Total.	Sh <b>ee</b> p.	Lambs,	Total.	
Douglas, , ,	•	•	•		•		•		

ISLE OF MAN during the Three Months ended 31st DECEMBER, 1905, EMBARKATION in IRELAND.

	SWINE.				Hor	SES.					
Fat.	Stores.	Total.	Goate.	Stal- lions.	Ma <b>re</b> s.	Geld- ings.	Total.	Mules or Jennets	Анкон.	Total Ani- mals.	IRIS <b>H P</b> ORT <b>S</b> .
										84	BELFAST.
										78	DUBLIN.
•	•		•	•	•	•	·	·	·	157	TOTAL.

ISLE OF MAN during the Three Months ended 31st DECEMBER, 1905, in the ISLE OF MAN.

1	BWINE.				Hor	ses.					
Fat.	S <b>to</b> res.	Total.	Goats.	Stal- lions.	Магев.	Geld- ings.	Total.	Mules or Jennets	Asses.	Total Ani- mals.	ISLE OF MAN PORT.
•	•	٠	·	•	·	•	•	•	•	157	DOUGLAS.

ISLE OF MAN during the Three Months ended 31st DECEMBER, 1905, DEBARKATION in IRELAND.

	SWINE.			ts. Stal- Marcs. Geld- Total. Jenn							
Fat.	Stores.	Total.	Gonts.	Stal- lions.	<b>Ma</b> res.	Geld- ings.	Total.	Mules or Jennets	Asses	Total Ani- mals.	lrish Ports.
											RELFAST.
					•	•	•				DUBLIN.
•	•		•	•	•		•	•	•	•	TOTAL.

ISLE OF MAN during the Three Months ended 31st DECEMBER, 1905, in the ISLE OF MAN.

	SWINE			HORSES.							
Fat.	Stores.	Total.	Goata.	Stal- lions.	Mares.	Geld- ings.	Total.	Mules or Jennets	Asses	Total Ani- mals.	ISLE OF MAN PORT
	•	•		·	•				٠	•	Douglas,

### COASTING AND

## RETURN of the Number of Animals Shipped to and from Places in Ireland of Embarkation

			CATTL	E.			SHERP.		l	SWINE	ì.
IRISH PORTS.	Fat.	Stores.	Other Cattle.	Calves.	Total.	Sheep.	Lambs.	Total.	Fat.	Stores.	Total
Cork to Aghada Pier,				2	2	1		1	Ī .		
" to Belfast		2		3	5				١.		
" to Spike Island, .	١.							•			
" to Queenstown, .						10	•	10			•
" to Waterford,		١.						•			
Total,	•	2		5	7	11	•	11	•	•	•
Agbada Pier to Cork, .						159		169	179		179
Dublin " .		1		1	2			٠,		•	
Spike Island " .					•						
Queenstown ,		•	•		•			•	42	•	42
Waterford " .		6	•		6		<u>:</u>				
Total,		7		1	8	159	•	159	221	•	221
Waterford to Ballyhack, .		24			24	•		•			
" to Belfast, .	•		•		•	•	•	•		•	•
,. to Duncannon,		304	•	55	359	1		1	·	15	15
Total,	·	328		55	383	1		1		15	15
Ballyhack to Waterford, .	•					•	•	•	17	•	17
Belfast to Waterford, .	•					1	-	1		1	1
Duncannon to Waterford,	69	71	•	1	141	68		<b>6</b> 8	1,633		1,533
Kilrush to Limerick	25	106			131				2,059		2,059
Kildysart ,,	- 1	.	.	. }		·			.	. ]	
Kilkee " .	.	.		.	•				•	•	•
Portumna	.	•		.		•	. 1	•	180	•	180
cariff , .	•	•	.	.	٠ ا	•	•	•		•	•
Banagher " .	•	•			:_		<u> </u>				•
Total,	25	106		•	131		·	•	<b>2,23</b> 9	•	2,239
Preencastle to Greenore,	·	50			50			•	30		30
Londonderry to Moville, .	•	1		1	2			•	•		
Moville to Londonderry, .	7	77	7	2	93	167	•	167	9		9
Sallina to Sligo,					. 1					1	1
Selmullet ,	.	26			26	22	.	22	1,216		1,246
Total, .	·	26		•	26	22		22	1,246	1	1,247
ligo to Belmullet.				•		•		•	•	•	•
Total,	101	668	7	65	841	429	-	429	5,295	17	5,812

## INLAND NAVIGATION.

during the Three Months ended 31st December, 1905, showing the Places and Debarkation.

Conti		Но	rses.		Mulesor		Total	
Goats.	Stallions.	Mares.	Geldings.	Total.	Jennets.	A8808.	Animals.	Irish Ports.
							3	Cork to Aghada Pier,
	1 . 1						5	" to Belfast.
	1 . 1		1 . 1		1 .			,, to Spike Island.
1					1 .		11	" to Queenstown.
١.			4	4	1		4	,, to Waterford.
1		•	4	4		,	23	Total.
	·						338	Aghada Pier to Cork.
	1 .				١.		2	Dublin "
١.	1 .							Spike Island "
١.	1 .						42	Queenstown ,
	1 .		3	3	•	·	9	Waterford "
			-		<u> </u>			
			3	3	·		391	Total.
	1 .		1 .				24	Waterford to Ballyhack.
			1	1	l .		1	" to Belfast.
	1 .		3	3		3	381	, to Duncannon.
	· .		4	4		3	406	Total.
<u> </u>	<u> </u>				·		17	Ballyhack to Waterford.
					ļ			
<u> </u>			· -		<u> </u>		2	Belfast to Waterford.
		3	5	8	· .		1,750	Duncannon to Waterford.
	.	1	1	2			2,192	Kilrush to Limerick.
		•		•	1 .			Kildysart "
· ·	1 .	•		•			·	Kilkee ,,
٠.	1	•	•	•			180	Portumna "
	•			•				Scariff "
	1 . 1							Banagher "
		1	1	2			2,372	Total.
		•	•		<u> </u>		80	Greencastle to Greenore.
							2	Londonderry to Moville.
	1	•	1	1	<u> </u>		270	Moville to Londonderry.
	1		<del></del>		<del>                                     </del>		1	Ballina to Sligo.
<u> </u>	<u> </u>	•					1,294	Belmullet "
<u>.</u>				•	<u> </u>		1,295	Total.
								Sligo to Belmullet.
1		4	18	22		3	6.608	Total.

RETURN of the Number of Horses Exported from Ireland through Great Britain to the Colonies and Foreign Countries during the Three Months ended 31st December, 1905, showing the Ports of Embarkation in Ireland.

						Number	of Horses.	
	Por:	rs.			Stallions.	Mares.	Geldings.	Total.
Belfast.		•	•			54	56	110
Cork, .						2	1	3
Dublin,					-	36	58	89
Greenore,					-	227	106	333
Larne					-		-	
Waterford,	•		٠	.	-	3	12	15
Tota	ıl.				_	322	228	550

RETURN of the Number of Horses Imported into Ireland through Great Britain from the Colonies and Foreign Countries during the Three Months ended 31st December, 1905, showing the Ports of Debarkation in Ireland.

					Number o	of Horses.	
	Por	TS.		Stallions.	Mares.	Geldings.	Total.
Belfast.	•			-	2	1	8
Dublin,	•		•	-	1	1	2
Т	otal,	•			3	2	5

## PASSENGERS TO PLACES OUT OF EUROPE DURING DECEMBER AND THE YEAR, 1905.

RETURN of the Numbers, Nationalities, and \*Destinations of the Passengers that left the United Kingdom for places out of Europe during the Month ended 31st December, 1905, and the Twelve Months ended 31st December, 1905, compared with the corresponding periods of the previous Year.

		}	Br <b>it</b> ish	Empire			FOREIG	ON COUN	TRIES.		Total for
NATION ALITY.	British North America.	Austra- lia and New Zealand.	British South Africa.	India. includ- ing Ceylon.	Other British Colonies and Pos- sessions.	Total.	United States,	Other Foreign Coun- tries.	Total.	Grand Total.	corres- ponding Period of 1901.
				M	onth ende	ed 31st D	ecember,				
Engli <b>sh, .</b> .	937	853	1,324	291	438	3,843	2,869	503	3,372	7,215	7,677
Scotch,	184	169	265	13	8	639	705	56	766	1,400	1,381
Irish,	55	96	84	4	7	246	637	26	663	909	1,094
Total of British origin.	1.176	1,118	1,673	308	453	4,728	4,211	585	4.796	9,524	10,152
Foreigners,	1,045	29	511	6	29	1,650	7.426	327	7,753	9,403	13,268
Nationalities not distinguished.	3	-		118	237	358	29	227	256	614	658
Total	2.224	1,147	2,214	432	719	6,7 <b>3</b> 6	11,666	1,139	12,805	19,541	24,078
Total for corres- ponding period, 1904.	2,374	1,045	2,080	582	718	6,794	16,376	908	17,284	24,078	
		and the second		Tweir	re Months	ended 31	st Decen	aber.	A LEA MARK ACTIVITIES	Anna Anna Anna	
English,	64,877	12,442	20,541	4,395	4,208	106,463	58,233	5,809	64,042	170,505	175,788
Scotch,	14,233	1.876	4,517	286	201	21,113	19,797	668	20,465	41,578	87,445
Irish,	3,347	863	1,225	35	49	5,519	44,359	277	44,636	50,155	58,257
Total of British origin.	82,457	15,181	26,283	4,716	4,458	133,095	122,389	6,754	129,143	262,238	271,43
Foreigners,	25,645	345	4,859	156	333	31,338	152.894	4,261	157.155	188,493	174,854
Nationalities not distinguished.	43	5		2,492	2,398	4.938	1,431	2,817	4,248	9,186	8,088
Total, .	108,145	15,531	31,142	7,364	7,189	169,371	276,714	13,832	290,546	469,917	453,87
Total for corresponding period, 1904.	91,684	14,210	82,278	7,054	6,943	1 <b>52</b> ,169	291,945	9,763	301,708	458,877	•

<sup>•</sup> The destinations given are, in all cases, based on the ports at which the passengers contracted to land. NOTE.—The above figures, being made up at the earliest possible date after the close of each Month, are subject to correction in the Annual Returns.

## Account showing the Quantities of certain kinds of Agricultural into Ireland in each Week from

	WEEK ENDED					
ARTICLES.	2nd Dec.	9th Dec.	16th Dec.	23rd Dec.	30th Dec.	
ANIMALS, LIVING— Horses,	1					
	•	•	•	.	•	
FRESH MEAT— Beef,				.		
Mutton, , ,		•	•	•	•	
SALTED OR PRESERVED MEAT-	1	1				
Beef,	•	7	•	•	•	
Hams,						
Pork, Meat, unenumerated, Salted or		3	.	.	. :	
Fresh	.		.	.	•	
Meat preserved otherwise than by salting,	192		_		:	
	192	• 1	•	•	• '	
DAIRY PRODUCE AND SUBSTITUTES— Butter, ewts.	ĺ	7	1	1		
Margarine.	193	148	162	240	51	
Oheese,	1,603	925 29	53	. 30	44	
mik, condensed,, .	. 10	28	. 33	. 30	. 14	
" Preserved, other kinds "		. i	•	.	• :	
EGGS, gt. hunds.	240	4,140	•	2,460	960	
LARD, cwts.	855	180	•	.	•	
CORN, GRAIN, MEAL, AND FLOUR-	133,300	17,500	156.100	105 900		
Wheat, Meal and Flour	68,300	16,200	6,600	125,800 72,400	3,600	
Dariey,	7,100	•	•	•	•	
Onts, , , Peas, , ,	50	380	:	120	20	
Beans			040,000	100,000	•	
Maize or Indian Corn, ,,	230,500	• '	243,700	136,800	• !	
FRUIT, RAW Apples,	6	58	.	11		
Currants,		•	•			
Gooseberries,	:	•		:	•	
Plums,		•		:	•	
Grapes,	:	•	:	: 1		
Oranges	:	:	:	:		
Strawberries,		•	:	:	: !	
HAY, tons	78	58	79	•		
Clare a core	10	7	_ '"	: 1	164	
Mone Tymeson	. 4	20	144	20	82	
HOPS	140	20	482	20		
VEGETABLES, RAW—	140	•	•	. 1		
Onions bushels	1,384	3,150	6,124	2,460	2,472	
Potatoes,	•	•	•	.	•	
Unenumerated, £	. 4	•		17	. 8	
Vegetables, Dried, cwts.	•	10 10	7	•	40	
Preserved by Canning, ,,	.	10	1	.	•	
POULTRY AND GAME, £	. 1			. 1		
,	1				ì	

This Table is confined to the Imports of certain kinds of Agricultural Produce into to a request from this Department kindly consented to separate the Irish Imports (direct) form of Weekly Beturns. It is hoped that the Department may soon be able to secure with these and such returns as the above, the Department will be in a position manufactured and agricultural products.

PRODUCE Imported direct (i.e. from the Colonies or Foreign Countries) 2nd December, 1905, to 24th February, 1906\*.

			WEEK	ENDED			
6th January.	13th January.	20th January.	27th January.	3rd Feb.	10th Feb.	17th Feb.	24th Feb.
	•	•				•	
	•	:	:	2,320 1,220	:	:	:
	139			:	:		•
. 1	:				:	. 1	:
149	1,138	1,400		617		76	•
. 60	5 157	. 141	182	. 173	182	182	•
5 4	89	21 67	923	156 75	17	40	
240	240 166	. 60	480 240	300 300	40	720 938	•
99,100 42,400	39,500 22,200 18,200	191,000 52,400	1,600 11,100	111,900 55,700 <b>49</b> ,600	1,300	44,200	6 16
250		. 60		20	400		:
117,600	163,600	140,500	215,200	227,000	215,600	139,500	184
							:
1:	:	:		•	•		:
:	:				•		:
. 60	38	3	140	48 76	71	15 50	:
•		•	•	•	•		•
510	1,080	3,482		1,932	4,042	4,360	:
	:	:		:			:
				•	•		

Ireland from the Colonies and Foreign Countries. The Board of Customs have in answer from those of the United Kingdom, and to supply this Department with them in the returns of Imports of all classes into Ireland which are re-shipped from Great Britain, to gauge the economic dependence of this country on other countries for its supplies of

Statistics and Intelligence Branch,
Department of Agriculture
and Technical Instruction for Ireland.

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## DEPARTMENT OF AGRICULTURE

AND

TECHNICAL INSTRUCTION FOR IRELAND.

## JOURNAL.

Meeting of the Council of Agriculture—The Vice-President's Address—Mortality among Sheep in Ireland—Home Buttermaking—Science in a General Education—Irish Bacon—Tuberculosis in Cattle—Marketing Irish Produce—Crop Reports, 1906—Fruit Crop Reports, 1906—Live Stock and Dead Meat Imports—Report on Butter Trade-Surprise Butter Competitions—Official Documents—Notes and Memoranda—Statistical Tables.

SIXTH YEAR.

No. 4.

JULY, 1906.



#### DUBLIN:

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### CONTENTS.

The Meeting of the Council of Agriculture,		•
The Vice-President's Address to the Council,		•
Mortality among Sheep in Ireland, by Falkner C. Mason,	M.R.C.V.S.	٠,
Home Buttermaking,	•	
The Place of Science in a General Education, by George	Fletcher	٠,
F.G.S.,	•	
Irish Bacon,	•	
The Prevention of Tuberculosis in Cattle,	•	
The Marketing of Irish Produce, 1. Eggs,		
" 2. Crammed Poultry,	•	
" " 3. Fruit,	•	
Summary of Crop Reports, 1906,		
Summary of Fruit Crop Reports, 1906,	•	
Foreign Live Stock and Dead Meat Imports into the	e United	f
Kingdom,		
The Report on the Butter Trade,	•	
The Surprise Butter Competitions,		
Official Documents:—		
Administrative,	•	
Agriculture,		
Technical Instruction,		
Veterinary,		
Notes and Memoranda:		
Meetings of the Boards, (748). Advisory Committee	on Fo	res
(755). Illegal Steam Trawling, (755). Summer		
Teachers, (756). Surprise Butter Competitions,		
Munster-Connacht Exhibition, (757). Vice-Regal (		
Irish Railways, (757). Royal Commission of Inquiry		
Districts, (758).		
STATISTICAL TABLES,		

#### NOTICE.

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### THE COUNCIL OF AGRICULTURE.

The ninth meeting of the Council of Agriculture was held on Tuesday and Wednesday, 15th and 16th May, 1906, in the Royal University of Ireland, Earlsfort-terrace, Dublin.

#### FIRST DAY.

Tuesday, 15th May, 1906.

The Chair was taken at 11.15 o'clock by the Right Hon. Sir Horace Plunkett, P.C., K.C.V.O., F.R.S., Vice-President of the Department.

The following were present:-

Representing the Department.—The Vice-President; Mr. T. P. Gill, Secretary; Professor J. R. Campbell, Assistant-Secretary in respect of Agriculture; Mr. George Fletcher, Assistant Secretary in respect of Technical Instruction; Mr. R. Cantrell, I.S.O., Chief Clerk; Mr. W. S. Green, Chief Inspector of Fisheries; Mr. J. S. Gordon, Chief Agricultural Inspector: Mr. W. G. S. Adams, Superintendent of Statistics and Intelligence Branch; Mr. J. P. Walsh, Clerk in Charge of Accounts; Mr. D. H. Lane, Inspector of Fisheries; Mr. J. D. Daly, Senior Staff Officer; Mr. T. Butler; Mr. J. V. Coyle; Mr. A. Kelly; Mr. J. Hogan; Mr. H. G. Smith; Mr. R. H. Lee; Mr. F. J. Meyrick: Mr. E. O'Neill; and Mr. D. J. M'Grath.

#### MEMBERS OF COUNCIL, ACCORDING TO PROVINCES.

#### Leinster.

Robert A. Anderson; Gerald J. Brenan, J.P.: Algernon T. F. Briscoe, J.P.; Stephen J. Brown, J.P.; Captain Loftus A. Bryan, D.L.; Thomas M. Carew; D. J. Cogan, M.P.; Major J. H. Connellan, J.P., D.L.; William M. Corbet; Thomas W. Delany; William Delany, M.P.; Robert Downes, J.P.; Colonel Nugent T. Everard, J.P., D.L.; William Field, M.P.; Rev. T. A. Finlay, M.A.; Toler R. Garvey, J.P.; Patrick Hanlon; Walter M'M. Kavanagh, J.P., D.L.; Patrick J. Kennedy, J.P.; Nicholas B. King; James M'Carthy; James MacMahon, J.P.; The Right Hon. the Earl of Mayo, K.P., D.L.; John J. Molloy, J.P.; George F. Murphy, J.P.; Patrick J. O'Neill, J.P.; Charles H. Peacocke, J.P.; Henry Reynolds; William R. Ronaldson; James Mackay Wilson, J.P.

#### Ulster.

Rt. Hon. Thomas Andrews, P.C., D.L.; Edward Archdale, D.L.; Frank Barbour; William Edmund Best; Rev. E. F. Campbell, M.A.; Alexander L Clark, J.P.; George Knox Gilliland, D.L.; Robert T. Huston, M.R.C.V.S.; Jeremiah Jordan, M.P.; Thomas Knipe, J.P.; Arthur S. Lough, J.P.; Francis J. Lynch; John S. F. M'Cance, J.P.; T. P. M'Kenna; H. de F. Montgomery, J.P., D.L.; James Stewart Moore, D.L.; George Murnaghan. M.P.; Robert H. S. Reade, D.L.; William Smyth, J.P.; Captain T. Butler Stoney, J.P., D.L.; Thomas Toal, J.P.

#### Munster.

Richard Barter, J.P.; James Byrne, J.P.; Captain William C. Coghlan, J.P.; Maurice Connery, M.D., J.P.; Thomas Corcoran, J.P.; Edmond Cummins, J.P.; Thomas Duggan; Patrick J. Hogan, J.P.; Most Rev-Denis Kelly, D.D., Lord Bishop of Ross; William M'Donald; Patrick S. Manning; Michael Mescal, J.P.; the Right Hon. Lord Monteagle, R.P., D.L.; Patrick F. Mullally, J.P.; Michael J. Nolan, J.P.; George O'Gorman; Thomas Power; Hugh P. Ryan; George F. Trench, J.P.

### Connaught.

The Right Hon. Lord Clonbrock, K.P., H.M.L.; John C. Conroy; P. J. Costello; Rev. Joseph G. Digges, M.A.; Patrick Flynn, J.P.; John Galvin; Sir Josslyn Gore-Booth, Bart., D.L.; Thomas G. Griffin; James P. MacGuire; Rev. Joseph Meehan, c.c.; Daniel Morrin; Colonel John P. Nolan, J.P.; John O'Dowd, M.P.

Mr. J. D. Daly acted as Secretary to the meeting.

The Minutes of the eighth meeting, 14th November, 1905, a copy of which had been sent to each member of the Council, were taken as read, and were accordingly signed.

The Vice-President delivered the first portion of his address,\* reserving the second part† for the following day.

The Council re-affirmed the arrangement made at previous meetings whereby the speech of a proposer of a resolution was limited to ten minutes, and the speech of a member other than the proposer of a resolution, to five minutes

The Council unanimously decided to appoint representatives to give evidence before the Committee appointed to inquire into the working and organisation of the Department.

<sup>\*</sup> See p. 613 et seq.

<sup>†</sup> See p. 621 et ecq.

On the motion of Rev. E. F. Campbell, M.A., the Council accepted the Vice-President's suggestion that each Provincial Committee should appoint two witnesses to give evidence before the Committee of Inquiry, in regard to the constitutional position of the Council and its relations to the Department.

The Council resolved itself into Provincial Committees for the purpose of electing members on the Agricultural Board and on the Board of Technical Instruction.

The Council re-assembled at 2 o'clock.

The Vice-President announced the result of the elections to the Boards as follows:—

#### AGRICULTURAL BOARD.

Leinster.—Mr. Patrick J. O'Neill, J.P.; Mr. Robert Downes, J.P.

Ulster .- Mr. H. de F. Montgomery, D.L; Mr. Arthur S. Lough, J.P

Munster .-- Most Rev. Denis Kelly, D.D., Lord Bishop of Ross; Mr. Patrick F. Mullally, J.P.

Connaught.—Most Rev. John Healy, D.D., Lord Archbishop of Tuam; Very Rev. James Daly, D.D.

#### BOARD OF TECHNICAL INSTRUCTION.

Leinster.—Rev. T. A. Finlay, F.R.U.I.

Ulster .- Mr. Frank Barbour.

Munster.—Mr. Thomas Power.

Connaught.-Most Rev. John Clancy, D.D., Lord Bishop of Elphin.

The Vice-President announced that the following members were selected by the Provincial Committees to give evidence before the Committee of Inquiry:—

Leinster .- Mr. William Corbet; Mr. Patrick J. Kennedy, J.P.

Ulster .- Mr. William E. Best; Mr. T. P. M'Kenna.

Munster.—Mr. Michael Mescal, J.P.; Mr. William M'Donald.

Connaught.—Mr. John Galvin; Rev. J. G. Digges, M.A.

The Vice-President said that he desired to make a personal explanation in regard to a question recently asked in the House of Commons concerning himself. The question referred to his connection with certain companies. The reply given in the House did not make it clear that the companies in question were private companies, and that his interest in them was comparatively small, and that his position in regard to them was mainly fiduciary. The rule prohibiting Ministers of the Crown and Civil Servants from acting as directors of companies had reference only to public companies. He was anxious that the Council should not be left under the impression that he had neglected their interests in order to attend to private affairs, or that he had acted in any way inconsistent with his official position.

Mr. M. J. Nolan suggested that in future the Vice-President's address should be printed and copies sent to the members of the Council a few days before the meeting, so that the members might have a better opportunity of criticising it.

The Vice-President said he would consider Mr. Nolan's suggestion.

Mr. To al desired to draw attention to the appointment of Mr. Porter, one of the Department's Agricultural Inspectors.

The Vice-President ruled that the matter was not in order. He might, however, explain that Mr. Porter was transferred to the Department at his present salary under the Act by which the Department was created. Mr. Porter had proved to be an efficient and faithful public servant.

Mr. A. S. Lough, Mr. William Delaney, M.P., and Mr. R. Downes suggested that more publicity should be given to the proceedings of the Agricultural Board and the Board of Technical Instruction.

The Vice-President said that the Department would discuss the matter with the Boards.

Mr. M. J. Nolan said that dissatisfaction had been caused by the recent appointment of Lord Ikerrin as inspector in connection with the marketing of produce in Great Britain.

The Vice-President pointed out that while this appointment had given rise to some controversy, there was as much public opinion expressed in favour of the appointment as against it. Lord Ikerrin's qualifications for the position were excellent, otherwise he would not have been appointed.

The Council proceeded to consider the question of further measures for the eradication of sheep scab.

Mr. Gill stated briefly the present position in regard to sheep dipping, and explained the action taken by the Department with a view to urging the local authorities to take more energetic measures for the eradication of sheep scab. The matter had now become most urgent

owing to the recent Orders of the English Board of Agriculture and Fisheries, under which no sheep from any part of Great Britain and Ireland could be exposed in any market or fair in Scotland, Wales, or the North of England during the autumn season, without being accompanied by a declaration that they had been properly dipped within a specified period.

After some discussion the following resolution was proposed by Mr. William Field, M.P., seconded by Mr. James Byrne, and passed unanimously:—

"That as the compulsory dipping of sheep twice in the year has been tried with successful results in Scotland, we recommend that the necessary steps be taken to have that system carried out all over Ireland, and we call on the local authorities to take into immediate consideration the suggestions in the Department's circular."

On the motion of Mr. William Field, seconded by the Earl of Mayo the following resolution was unanimously adopted:—

"That the Poisons and Pharmacy Bill now before Parliament should be extended to Ireland so as to enable Local Authorities, subject to regulations laid down by Order in Council, to issue licences authorising persons other than Pharmaceutical Chemists, Chemists and Druggists, and Registered Druggists, to sell sheep dips, weed killers, and other poisonous substances for use in connection with agriculture and horticulture."

The Vice-President said that the Department and the Agricultural Board desired the opinion of the Council as to whether the Department should take part in the Dublin International Exhibition, 1907. He explained the action that the Department had taken in regard to the Exhibitions at Glasgow, St. Louis, Cork, and Limerick, and described briefly the present position of the Department's funds.

After some discussion the following resolution was proposed by the Earl of Mayo, and seconded by Mr. P. J. O'Neill:—

"That this Council approves of the Department of Agriculture and Technical Instruction taking part in the Dublin International Exhibition, 1907."

## Mr. T. P. M'Kenna proposed the following amendment:-

"That in the opinion of this Council any contribution made by the Department of Agriculture and Technical Instruction to the forthcoming International Exhibition should be exclusively devoted to a section or exhibit reserved for the products of Irish industries."

The Earl of Mayo accepted Mr. M'Kenna's amendment.

The amended resolution was thereupon formally moved by the Earl of Mayo, and seconded by Mr. M'Kenna, as follows:—

"That this Council approves of the Department of Agriculture and Technical Instruction taking part in the Dublin International Exhibition, 1907; and that in the opinion of the Council any contribution made by the Department to the Exhibition should be exclusively devoted to a section or exhibit reserved for the products of Irish industries."

The following amendment was proposed by Mr. H. de F. Montgomery, and seconded by Most Rev. Dr. Kelly: -

"That while we do not wish in any way to discourage any such undertaking as an International or as an National Exhibition, we do not consider that the various imperative calls on the limited funds of the Department will leave them sufficient resources to justify the Department in making any substantial contribution to the funds of any industrial exhibition in the immediate future."

The amendment was put and was declared carried by 32 votes to 21.

The amendment was then put as a substantive resolution and adopted without a division.

The Council adjourned at 5 p.m.

At the conclusion of the proceedings the members of the Council, on the invitation of the Vice-President, proceeded to the Albert Agricultural College, Glasnevin, where they inspected the College and Farm.

#### SECOND DAY.

Wednesday, 16th May, 1906.

The Council met at 11 o'clock.

The Vice-President delivered the second portion of his address,\* which dealt with the following question submitted for discussion by the Department:—

"Whether the Department should promote agricultural organisation generally; and if so, whether they should do so through the agency of the Irish Agricultural Organisation Society."

In the course of his address the Vice-President explained that the question was submitted for discussion in view of the following resolution,

which was adopted by the Agricultural Board at their meeting on 20th March, 1906.

"That the Board vote a sum not exceeding £3,700 in respect of agricultural organisation, to cover a period of one year, on the conditions subjoined. They decide to continue their support of the Irish Agricultural Organisation Society for the period named as a provisional measure; but they desire, before considering any further contribution for this purpose, to have the opinion of the Council of Agriculture on the subject of the best method of aiding such organisation, and they request the Department to place this subject on the Agenda for the next meeting of the Council."

Mr. A. S. Lough asked for information in regard to the relations between the Department and the Irish Agricultural Organisation Society prior to 1904. He was not aware that previous to that date any grants to the Society had been sanctioned by the Agricultural Board.

The Vice-President referred to the minutes of the Board which dealt with the matter. No information had been withheld from the Board, who had free access to all details of the Department's expenditure.

The following resolution was proposed by Colonel Everard, seconded by Lord Monteagle, and passed unanimously:—

"That in the opinion of this Council it is desirable that the Department should promote agricultural organisation and provide the funds necessary for the purpose."

The Council then proceeded to discuss the question whether the Department should promote organisation through the agency of the Irish Agricultural Organisation Society.

After considerable discussion, the following resolution was proposed by Mr. T. P. M'Kenna, and seconded by Mr. John Galvin:—

"That this Council considers it inadvisable to have further moneys expended through any irresponsible society; and that all work in connection with the interests of agriculture generally be carried out directly by the Department itself and through the representative bodies provided by the law for the purpose, viz., County Councils and County Committees."

After further discussion Mr. Lough suggested that the question should be postponed until the next meeting of the Council.

Mr. M'Kenna accepted the suggestion.

The resolution was accordingly by leave withdrawn.

Mr. William Best suggested that before the next meeting a full explanatory statement of the working of the Irish Agricultural Organisation Society should be circulated among the members of the Council.

This suggestion was noted.

The following resolution was proposed by Mr. William Field, M.P., seconded by Mr. George O'Gorman, and passed unanimously:—

"That, as experience has shown, so long as inferior, ill-bred, deformed, diseased, or closely inbred animals are allowed to propagate their breeds in Ireland it is difficult to obtain a general improvement of live stock. We therefore recommend that measures be taken to register every stallion, bull, ram, and boar in Ireland, and that no animal be permitted to serve except those registered, which shall be up to a certain standard of merit."

The Vice-President said that legislation would be required to give effect to this resolution. The Department, however, would discuss the question with the advisory committees on live stock.

The following resolution was proposed by Mr. William Field, M.r., and seconded by Mr. Edmond Cummins:—

"That in view of the alarming decrease in the number of pigs exported from Ireland when the restricting-Orders re swine were enforced, whilst we are in favour of compulsory sheep dipping yet we regard with alarm the adoption of the new Order until a reasonable period has been allowed to again seek the immediate co-operation of Local Authorities so as to provide dipping facilities and make suitable arrangements for obtaining certificates and declaration forms, and that a conference be at once held between the Department and the County Councils, to consider the whole subject and to hasten operations amicably."

After some discussion it was pointed out that Mr. Field's resolution on the subject of sheep scab, which was adopted on the previous day (see ante, p. 605), rendered this second resolution unnecessary.

Mr. Field concurred, and the resolution was accordingly by leave withdrawn.

The following resolution was proposed by Mr. William Field, M.P., seconded by Mr. H. de F. Montgomery, and passed unanimously:—

"That the Government be requested to furnish an account of the money collected from Crown and Quit Rents in Ireland, and how it has been disbursed; also to state the average revenue to be expected from Crown and Quit Rents. That an adequate establishment grant be given, together with a sufficient annual income to establish and maintain a Forestry Branch of the Department of Agriculture and Technical Instruction for Ireland." The following resolution was proposed by Mr. William Field, M.P., seconded by Mr. C. H. Peacocke, and passed unanimously:—

"That the formation of a Public Health Museum by the Department of Agriculture and Technical Instruction for Ireland illustrating the various causes that influence the health of the individual and community, would be of material service to the public as one of the most practical methods of teaching hygiene, and so diminishing the prevalence of Consumption and other diseases in this country."

At the request of the Vice-President, Mr. Fletcher, Assistant Secretary in respect of Technical Instruction, said that the Department were in sympathy with the resolution, but thought that it would be very difficult to carry it out. A museum of the kind described would naturally be attached to a faculty of Public Health. If it were possible to establish a Faculty of Public Health in connection with the College of Science, he was certain that it would be of great benefit to the country. The difficulty was that, at present, the Department had not the funds to establish such a museum, and if they had the funds there was no available space in the existing buildings.

The following resolution, standing on the agenda paper in the name of Mr. R. H. Reade, was not moved, as Mr. Reade was unable to be present:—

"That the grant of £350 to the Flax Supply Association for carrying on the Millisle experiments be continued."

The following resolution was proposed by Mr. Patrick Hanlon, and seconded by Mr. William M. Corbet;—

"That we protest against the Department's declining to carry into effect a resolution passed by this Council recommending that a stud of Irish draught horses be started on their farms; that we cannot believe, with the resources at their command, that this would be impossible, and that we think it the best and only way to firmly establish the Irish draught horse as a special breed."

Professor Campbell explained the action which the Department had taken in order to carry into effect the resolution which had been adopted, on the motion of Mr. Hanlon, at the previous meeting of the Council (see Journal, Vol. VI., No. 2, page 213). The advisory committee on horse breeding, to whom the matter had been submitted, were of opinion that it was not desirable to establish a stud at one of the Department's agricultural stations. It was considered that an agricultural station would not be suitable for this purpose.

After some discussion the following amendment was proposed by Mr. Robert T. Huston, and seconded by the Rev. E. F. Campbell:—

"That the proposal to establish an improved breed of draught horses, such as this country requires, by means of studs at the Department's educational farms is not the most practicable course to adopt in order to secure the object desired."

"That in the opinion of this Council there is required for this purpose a separate and special establishment where not only brood mares of the Irish draught type can be kept, but where colts likely to make good sires, purchased throughout the country, may be reared until fit for service; and that a stud book for that breed be established."

After further discussion Mr. Hanlon accepted Mr. Huston's amendment.

Mr. Huston's amendment was thereupon put as a substantive resolution, and was passed unanimously.

The following resolution was proposed by Mr. William M. Corbet, seconded by Mr. Huston, and passed unanimously:—

"That in future under the Department's horse-breeding scheme, half-bred registered sires should be put on an equality as regards premiums and service fees with other registered sires recognised under that scheme."

The following resolution was proposed by Mr. Edward Cummins, and seconded by Mr. Thomas Corcoran:—

"That the Department of Agriculture be requested to take into consideration at an early date the question of providing mares suitable for breeding purposes for farmers under a certain valuation, such valuation to be fixed by the Agricultural Board."

After some discussion the Vice-President explained that the Department were in sympathy with the views of Mr. Cummins, but that having regard to the present resources of the Department, it would be impossible to carry out his suggestion. The matter, however, would be referred to the advisory committee on horse breeding.

Mr. Cummins said that in view of the Vice-President's statement he would not press his resolution.

The resolution was accordingly, by leave, withdrawn.

The following resolution was proposed by Mr. C. H. Peacocke on behalf of Mr. James Byrne, and seconded by Mr. William Field, M.P.:—

"That as the Germans have discovered a more reliable method of ascertaining whether cattle suffer from tuberculosis, than by the tuberculin test, and for that purpose have established a College at Kiel, it would be advisable to send some members of the Irish Veterinary Staff to report on the subject."

After some discussion, the Vice-President said that, as at present advised, he did not think it desirable to send officials to Kiel, but, if the Council would leave the matter in the hands of the Department, he would undertake to make enquiries Later on, if necessary, he would send some members of the Veterinary Staff to the Continent to investigate the matter.

Mr. Peacocke accepted the Vice-President's suggestion, and the motion was accordingly, by leave, withdrawn.

The following resolution was proposed by Mr. John J. Molloy, and seconded by Mr. William Field, M.P.:—

"That all suggestions, plans and schemes, within the province of the Department—including any alterations in what already exists—supported by a majority of this Council at a meeting thereof, be carefully examined by the Department, and a detailed report of the value and suitability of each be placed before the next following meeting of the Council."

The Vice-President suggested that the resolution should be amended as follows:—

"That all suggestions, plans, and schemes, within the province of the Department—including any alterations in what already exists—supported by a majority of this Council at a meeting thereof, be carefully examined by the Department, and that a general report on the action taken on such resolution be furnished to the Council."

Mr. Molloy accepted the Vice-President's suggestion, and the amended resolution was then put and passed unanimously.

The following resolution was proposed by the Rev. J. G. Digges, M.A., and seconded by Mr. R. A. Anderson:—

"That in the interests of Beckeeping in Ireland, it is desirable that the Department of Agriculture should promote legislation for the better prevention of Bee Pest (Foul Brood) in this country."

Professor Campbell stated the views of the Department in reference to this question, and explained briefly the provision that might be made by the County Committee throughout the country, under the bee-keeping scheme, for dealing with this pest.

Mr. Molloy suggested that it would be better to defer the consideration of Mr. Digges' resolution until some experience had been gained of the working of the Department's scheme.

The Vice-President said that if Mr. Digges accepted Mr. Molloy's suggestion he would have the matter placed on the agenda for the next meeting of the Council.

Mr. Digges accepted the suggestion, and the resolution was accordingly, by leave, withdrawn.

The following resolution was proposed by the Rev. J. G. Digges, M.A.:—

"That the money recently expended upon the fitting up of lavatories at the Agricultural College, Glasnevin, constituted an inexcusable waste of public money."

The resolution was not seconded.

Mr. Gill dealt at some length with the allegations contained in the resolution, and offered to give details of the expenditure asked for by Mr. Digges if the Council desired to have them.

The Council did not desire that Mr. Gill should give the particulars in question.

The following resolution was proposed by Mr. H. de F. Montgomery, and seconded by Mr. Best:—-

"That the public money voted by Parliament and by the Local Government Bodies for improving the dwellings of the classes living by agricultural labour in Ireland should be made available in a greater variety of modes, so that it may be laid out to greater advantage for the benefit of the classes concerned under the varying circumstances of various districts, and we hope that provisions in this direction will be embodied in the forthcoming Labourers' Bill."

After some discussion it was suggested that, owing to the lateness of the hour, the resolution should be postponed.

Mr. Montgomery accepted the suggestion and the resolution was accordingly, by leave, withdrawn.

On the motion of Mr. H. de F. Montgomery, seconded by the Rev. E. F. Campbell, M.A., a vote of thanks to the Vice-President was passed unanimously.

The Vice-President replied.

The proceedings terminated at 5.15 p.m.

# THE VICE-PRESIDENT'S ADDRESS TO THE COUNCIL OF AGRICULTURE.

#### FIRST DAY-15th MAY, 1906.

My Lords and Gentlemen,—For the third time it is my privilege to address a newly elected Council of Agriculture. This Council will not be altogether new to its work, as nine out of every ten of its members have served before; but it will find itself face to face with a wholly new situation. A new Government has come into office, and has declared its policy to include a radical reform in the whole system of Irish administration. The King's Speech at the opening of the present Parliament places in the forefront of the ministerial proposals the introduction of "means for associating the people with the conduct of Irish affairs," words which will have a familiar sound to those of you who took part in the movement which led up to the creation of this Department and who have helped it over its initial difficulties.

#### COMMITTEE OF INQUIRY.

And what more immediately concerns us, a Committee has been appointed with the widest possible reference to inform the Government and the public as to what this Department is, what it has been doing, what it is doing, and whether it should be ended, mended, or left alone further to develop in practical life that devolution upon which, in theory, so many people are nowadays agreed. The inquiry has begun, and the Chief Secretary has stated in Parliament that 215 statutory bodies conversant with the working of the Act establishing the Department have been invited to make observations. Several of these bodies have already met to decide upon the nature of the evidence to be tendered, and to select delegates to appear in their behalf.

### Position of Council in relation to the Inquiry.

I presume you will wish to take similar action. As you will see by the reference to the Committee, the relations between the Department and the Council are to be inquired into, and these obviously cannot be left to be decided upon the *ex parte* statement of your Chairman. But this is only part of a much larger question. The

Committee are to inquire whether the constitution of the Department is suited to Irish conditions, and upon the decision at which they arrive on this question may depend the continued existence of the Council. I suppose, therefore, that you will wish to give, and I am certain the Committee will expect you to give evidence in your corporate capacity; and this you could do only by nominating certain of your members to represent your views. I suggest for your consideration that the Provincial Committees, when they presently discharge their electoral functions, might each appoint one or two persons to appear as your representatives before the Committee. As this matter must of necessity be uppermost in your minds, I propose to divide my address into two parts-to restrict my observations to-day to constitutional questions, reserving until the opening of to-morrow's meeting the expression of the Department's views upon certain important matters upon which I think it right you should be consulted.

### POPULAR ELEMENT IN THE CONSTITUTION OF THE DEPARTMENT.

In considering the Department's constitution the cardinal fact to be borne in mind is, that it differs from that of all other branches of government in these islands in one important respect. A popular element, at the head of which this Council stands, and for which, therefore, it speaks with paramount authority, has for the first time, as far as I am aware, been added to the machinery of our central government. Now it is widely asserted that this popular element is a sham—or, to be more specific, that the Council and the two Boards are not so constituted as to be truly representative; that their functions and powers are not such as to enable them to give effect to the popular will, or to fulfil the purpose for which the Department was created. Here are two distinct issues—representativeness and control. I will take them separately.

#### REPRESENTATIVE NATURE OF THIS POPULAR ELEMENT.

The popular element is said to be not truly representative because one-third of the Council and of the Agricultural Board and one-fifth of the Board of Technical Instruction are nominated by the Department. We may all agree that, under the party system, any body upon which public functions are devolved should, in order to be popular, have a decided majority of members chosen by the people through a popularly constituted electoral machinery.

To the plain man it would appear that, as two-thirds of you are directly representative of popularly elected County Councils,

you must be, as to two-thirds of your membership, popularly representative. But a new constitutional theory has upset all preconceived notions of representative government. The nominated onethird is said to outweigh the elected two-thirds. It seems that the person responsible for the nomination of the one-third chooses his men with such a profound insight into human nature that one of them exercises more influence than two of the County Council representatives! But now let me give you a few facts which show, not how the system might work, but how it does work. In the last Council-and I take that because it might be said that the constitution of this Council has been modified in order to make a casethe nominated third happened to include three Nationalist, M.P.s. three Catholic clergymen, and several others of the same political and religious persuasion. Three years ago the Council, in the discharge of its electoral functions, which it will repeat to-day, had to appoint twelve persons to serve on the Boards. Nine members of the Council were elected and three non-members. Of these nine members, five had been appointed by the Department, and four by the County Councils.

This shows, I think, that the Council has regard only to the qualifications of those it selects and does not pay much attention to the distinction between elected and nominated members. I know the answer which will be made. The Council, it will be said, consists of two Nationalists to one Unionist, but the country contains at least three Nationalists to one Unionist. Therefore, the Council is not truly representative. This is what my cowboys, who were great logicians, used to call "a dead open and shut"-a metaphor taken from a species of trap, but it means a self-evident proposition. In case any defenders of the Department's constitution should be caught, I had better suggest a way out. It is vitally important that the popular element we are discussing should be representative not only in a political but also in a business sense. The influence of the Council and the Boards will be helpful in proportion as their members are, and are recognised to be, competent to speak for the agricultural, commercial and industrial interests of the country. Now it happens that, mainly owing to well-known historical causes, the men most prominent in our commercial and industrial life formerly belonged almost entirely, and still belong largely, to that section of the population which is politically in the minority. On the other hand local representative bodies must, in the nature of things, at any rate in times of political excitement, send forward

to this Council men who belong to the predominant party in those bodies. I hold strongly that any device resorted to, in order to adjust the political balance, would be a fatal error. It would subordinate business to politics in a branch of government whose efficiency depends upon it being non-political in its administration. It would destroy the confidence of business men in your proceedings, and the Department would lose their co-operation and probably have its usefulness fatally impaired. I submit, therefore, that it is a wise precaution to preserve to the Department its right to nomination—a right which any Vice-President who cares for the success of his work will exercise with the sole object of getting the most representative men to serve upon the Council.

#### CONSTITUTION OF THE BOARDS.

The same principle applies to the Boards, though for a somewhat different reason. The Technical Instruction Board consists of twenty-one members, of whom only four are nominated by the Department—too small a proportion as I think. people think the Agricultural Board ought to be wholly appointed by the Provincial Committees, instead of being two-thirds so appointed and one-third nominated by the Department. I am not myself bigoted upon this subject, though I believe that a full discussion at this Council would result in the present arrangement being upheld for several reasons. The Provincial Committees can consider only the qualifications of the individuals, but the Department is able to consider also what I may call the make-up of the team as a whole. They can taking an all-Ireland rather than a provincial view, and having regard to the multiplicity of the matters which will come before the Boards, make sure that these bodies will be representative in every respect.

The Department, too, has a large responsibility in respect of the endowment as distinct from the contributions from the rates, and this seems to me to give it a right to a voice in the constitution of the purse-controlling Boards. Lastly, it is an advantage to us, and I think to the country, that we should be able to put in a place of honour and responsibility men who have shown the capacity and the desire to help us in our work. This may not be "a dead open and shut," but I think it is common sense.

#### FUNCTIONS AND POWERS OF THE COUNCIL.

So much for the question of representativeness. I now come to the question of control: the question of your functions and powers and those of the Boards. At the first meeting of this Council held six years ago, some of you will remember how I deprecated the view that this body was a sham because, apart from its electoral functions which it was to exercise only once in three years, it had but the barren privilege of making complaints to which the Department might turn a deaf ear, and of offering advice which might be declined with thanks. Now, after six years, during which the policy and procedure of the Department have been submitted to your criticism and moulded, as I am prepared to prove, in accord with your expressed wishes, those who condemned you in advance to impotence still maintain that you are not only incompetent to speak for Irish public opinion upon the questions referred to you, but that such power as you were intended by Parliament to possess has been taken from you by the autocratic and irresponsible behaviour of the Vice-President. That is, of course, a question of fact, and I personally am very glad that the whole truth is to be brought to light in a public inquiry.

Upon the evidence you may see fit to give as to my conduct I have nothing to say, and shall confine myself to the consideration of the question of the reality or otherwise of your influence.

## REALITY OF THE INFLUENCE OF THE COUNCIL.

I have stated frequently that, so real and effective did I consider your authority to be, the moment I lost your confidence I should immediately vacate my post. You know the circumstances under which I am in office to-day. In December last the Government asked me to continue to discharge the duties of the post provisionally because they wished to examine the Department as it had been working for the last six years and as it was working then. They wished to keep me in a position to give from the inside such explanation as to the organisation, aims and working of the Department as the Committee they were going to appoint might require. I did not see how I could refuse their very reasonable request, and I well knew what would be said if I seemed to run away from the inquiry which was to be held. The Agricultural Board formally approved of my action, and I hope you will do the same.

I am quite aware that the influence which you can exert upon the Vice-President of the Department is only one side, and not the most important side of your real power. The influence of the Council is not simply a negative force—a force which says, this or that man must go, or this or that thing shall not be done. Your influence will continue to grow, because your appeal is not to the passion of the hour, but to the best thought and most practical sense of the country. Even in Ireland, a country unsurpassed in the variety of its conditions physical and moral, you could not collect in one room a body of men with more divergent interests, with more opposing views upon the question they debate. Yet looking back upon the meetings of the last six years, I ask has any body of men in Ireland or in any other country ever behaved to each other in a more friendly and conciliatory way? And in the building up of a people these things count. But I must not rely upon impressions: I must produce facts. It would be strange if a body brought together from every county in Ireland, cognisant of the needs and expressing the views of every section of the people, could not make its influence real and effective. And so they have.

# ACTION TAKEN BY DEPARTMENT ON RESOLUTIONS OF THE COUNCIL.

I have had the curiosity to look through the resolutions which have been proposed and discussed. I find that no less than 80 have been dealt with, making an average of 10 per meeting. Eighteen were withdrawn on promise of consideration by the Department. Eight out of the eighty were expressions of opinion and so forth calling for no action. That leaves 72. Fiftynine were acted upon. That leaves 13. Upon 9 action was taken, but not to the full extent called for by the resolution. That leaves four, upon which it was found, on reconsideration, inadvisable to take any action at all. This is a record which shows that the Department have at least attempted to meet your wishes.

# THE COUNCIL A LINK BETWEEN THE COUNTY COUNCILS AND THE DEPARTMENT.

Lastly, and most important of all, it is as a link between the County Councils and the Department that this Council performs its highest functions of bringing and keeping the central administration in touch with local opinion. Nothing so clearly demonstrates to me that the members of the Council have responded to the earnest appeal which I made to them six years ago, to fulfil this part of their mission, as the almost total absence from the eighty resolutions which were proposed of any indication that the friction of which we hear so much between the County Committees and the central department has any real existence. The plain fact is, that it is

those who stand outside our work, and not those who take part in it, that are responsible for the great majority of the allegations of unreasonable conduct on the part of the Department.

#### Functions and Powers of the Boards.

There remains to be considered the functions and powers of the It has been suggested that they should have initiative and decision upon administrative questions as well as a veto. over and over again explained that the veto has a very positive as well as a negative effect. It is really unnecessary to elaborate the way in which the power of the purse can be used. If there is any doubt whatever as to the way in which it has been used. let members of the Boards who are here enlighten the Council on the subject. Let them say whether there has been any unreasonable restriction of their right of discussion, or whether it has been my practice to consult them not only when I wanted their approval and their money, but whenever questions of policy arose in respect of which, although they had no statutory authority, they would be interested in the decision to be arrived at. I fancy that a good deal of the agitation for constitutional reform in the Department arises from a feeling that the Boards, and not the Department, should exercise the patronage.

# THE QUESTION OF CENTRAL ADMINISTRATION AND PATRONAGE.

I do not envy them the task, and if some day, when we are forgotten some litterateur produces "A Vice-President's Post Bag," its readers will not envy me. I am glad that I, and not the Boards, have to face the unpopularity incidental to the appointment of the best men, to fill new posts, for which the educational facilities previously existing in Ireland had given Irishmen no opportunity to qualify. But here a big question of principle is involved, upon which I will give you my own views for what they are worth. I hold that in central, as distinct from local government, giving administrative functions, including patronage, to unpaid boards is a mistake. Even assuming that you can secure such an attendance as is required for efficient routine work, you never know where to place the responsibility for anything that goes wrong. Nor do I think that elective and paid Boards would work well.

#### NECESSITY FOR INDIVIDUAL RESPONSIBILITY.

In a great public service with complex and miscellaneons functions, some one person should be responsible to public opinion, not only for his own acts, but also for the acts of all his staff, over whom he should have full authority, backed by the confidence of the public. The moment he fails efficiently to discharge his duties and loses public confidence, the sooner he is got rid of the better. I say this in the full knowledge that this avowal will be held by many to be a virtual admission that I ought not to have agreed to the arrangement suggested by the Government, which has been frequently stated in Parliament to be a cause of grave dissatisfaction to the Irish people, and in flagrant contravention of the understanding that Ireland was to be governed according to Irish ideas.

# SUMMARY OF ARGUMENT.

Now, gentlemen, let me sum up the argument I have submitted for your consideration. In defence of the popular element in the constitution of the Department, I have urged that it is representative in the double sense—that it represents popular opinion on the one hand, and the varied interests concerned in the Department's administration on the other. I have tried to show that the Council has real and not imaginary influence, and that the Boards have real and not imaginary power. This, I think, is the distinction which should be borne in mind. If you are representative, you should have influence; and, in order-to make that influence effective, the Boards should have power. I believe that constitutionally the power the Boards already possess of withholding supplies from schemes which they disprove is adequate. I am sure, you will at any rate, consider carefully the facts and opinions I have submitted, before you advocate radical changes in the constitution of a branch of government which, whatever its defects, has gone further in the popular direction than that of any other branch of government in these islands, and will, I hope and believe, when the inquiry is complete, be shown to have associated the Irish people with the conduct of their affairs in a degree not a little creditable to the people, to their representatives in this Department, and to the staff, who have done the chief part of the initiation and organisation, and have, to the best of their ability and with a zeal and industry I have never seen exceeded, assisted in the carrying out of the work.

In conclusion, if you will allow me to say so, I think that something more is involved in the course you take at this meeting than the particular issues which, it would appear, you are called on to decide. I have never known a situation in our affairs where

courage and independence, qualities which this Council has not so far lacked, were so urgently needed for the upbuilding of our national life. In public life, no man or body of men, ever did any real service to their country if it was conditioned by popularity. Service implies sacrifice, and in Ireland it is very apt to be the sacrifice of popularity which has to be endured. But, after all, in the long run we shall be known by our fruits, and, in the meantime, it is no bad plan to have our consciences at rest.

# SECOND DAY-16th MAY, 1906.

MY LORDS AND GENTLEMEN—The peculiar circumstances which compelled me yesterday to deal with only constitutional questions, and the large amount of important business which you have to get through to-day, has made it necessary for me to restrict the promised continuation of my address to very narrow limits. I propose, with the briefest possible introduction which is necessary to put the matter in its proper setting, to deal only, and very briefly, with the chief subject which the Department has put down upon the agenda paper for your consideration.

Deeply concerned as we all must be for the revival of decayed, the development of existing, and the introduction of new industries, you have only to analyse the actual, and to estimate the potential, wealth of the country to realise how far more urgent is that part of the Department's work which aims at increasing the quantity and improving the quality of the yield from the soil, and enabling our farmers to market their produce expeditiously and economically. In order that our discussion may be practical, let us confine ourselves to the consideration of those aids to the farmers which are within our province. I know you will not want to discuss questions of land tenure, and even my friend, Mr. M'Carthy, the economist from Louth, will allow me to rule him out of order if he proposes to advocate a tax upon imported food stuffs.

Mr. Field has omitted to plant upon the agenda paper one of what he has pathetically called his hardy annuals, and we are not being asked to buy up the railway companies and run them at a loss—and at a profit to the farmer.

# AGRICULTURAL ORGANIZATION.

And not only shall I not go outside the limits of the Department's

functions and powers, but within those limits I propose to restrict myself to that aspect of agricultural development which stands first upon the agenda paper for our discussion to-day—the question of agricultural organization. I must omit altogether the improvement of our technical methods, as I want to deal with what I may call our business methods both in agricultural production, distribution, and finance. But in passing away from such a vast field of inquiry as that of the Department's educational and other agricultural development operations, let me refer to just one criticism which I see commonly brought against the Department, and which I believe that the wider dissemination of Departmental information might serve to allay.

# THE QUESTION OF TILLAGE.

The critic who, scorning details, wishes, while he is about it, to make big, sweeping charges against us, if he is agriculturally minded, throws the agricultural statistics at our heads and says that, in spite of all our schemes, and perhaps because of them, the acreage under tillage goes on getting beautifully less. Now, upon this subject I have just this one thing to say. There is no part of our work in which we are more anxious to succeed than that which aims at bringing more land under the plough. And, as a matter of fact, whatever the statistics show in the aggregate in some districts as the result of the Department's operations, the methods of cutivation have been successfully improved. One important proof of this is the great increase in the use of artificial manures, and a vastly more scientific method in the application of particular manures to particular soils. But what people forget is that we have no power to make a farmer till more land than he wants to till. We have done our utmost to provoke discussion upon the advantage of tillage generally, and also in connection with winter dairying. But we do not find it easy to interest people in this subject, and we ask you to bear this in mind and to assist us by every means in our power. Lastly, when you hear people saying that the Department is doing nothing to increase tillage—if they do not know what they are talking about you need not waste your time But if they are practical farmers, will you ask them to be good enough to tell you what, exactly, the Department could do which would induce them to break up an acre of land that is very likely at the present moment growing two thistles where one grew before. It is a subject upon which His Grace the Archbishop

of Tuam has propounded opinions which it might be inadvisable for a layman, still more an official, to express.

NEED FOR REVOLUTION IN BUSINESS METHODS OF FARMERS.

I now beg to submit the somewhat strong but, in my judgment, unanswerable, proposition that, no matter what improvements you effect in the technical methods of the Irish farmers, unless you can at the same time bring about a revolution in his business methods, you will not counteract the tendency known as the rural exodus in most countries, which takes the form with us of emigration and, worse still, of deterioration, owing to the quality of the human element which leaves our shores. The change proposed in the business methods of the Irish farmer is simply this. By whatever means this is to be attained, he must be taught to combine with his neighbours whenever and wherever some branch of the industry by which he lives can be more profitably conducted in combination than through isolated action.

#### COMBINATION ESSENTIAL TO SUCCESS.

Combination is resorted to by those engaged in every other It is resorted to by those engaged in farming in occupation. every European country, in all the colonies, in India, and indeed, wherever farmers are progressive. Some seventeen years ago what I am saying now was said in Ireland, by a few The doctrine they preached was put into practical operation first in the dairying districts. Had this pioneer work not been done it is hard to say what would have become of the dairy farmers of Munster. Later on the Irish Agricultural Organization Society was formed, and small beginnings became a big movement. In this one respect the Irish farmer seemed to be going ahead of the English and Scotch farmer. Some five years ago an English Agricultural Organization Society was started and is now making great progress among English farmers. A few weeks ago a Scottish Agricultural Organization Society was inaugurated. moters of both these British societies, acknowledge the parentage of the Irish society, are determined to follow in its footsteps, and are very sorry that we did not have to follow in theirs.

Now, gentlemen, I must not occupy your time in arguing in favour of the principle of co-operation, or in giving you a description, which would take many hours to do exhaustively, of its many applications to the farming industry, and the profits to be gained

in each case. All these things have been settled long ago. No man will get up in this meeting and question the desirability, or I should say the necessity, of the application to farming of the principle of self-help made effective by organization. I will sum up in a very few words the reasons why the matter has become especially urgent in Ireland.

#### PRESSURE OF FOREIGN COMPETITION.

Foreign competition, brought about by rapid and cheap transportation, combined with improved methods for keeping produce fresh in transit, has brought the farmers of the uttermost parts of the earth into competition with our farmers. These producers have advantages over us which we cannot successfully counteract. On the other hand, in spite of all the improvements which science has introduced into transportation, we have one advantage over them which cannot be wholly abolished, that is our nearness to market. Upon the extent to which we utilise that advantage the prosperity of Irish farmers largely depends. Other European countries suffer from the same disadvantage in respect of the distant competition, but they make the most of the advantage which we also possess, and they rout us, horse, foot, and dragoons, in the commercial competition which modern economic changes have brought about. How do they do it? They do it by greatly improved technical methods, and by organization upon co-operative lines applied to agricultural production, distribution, and finance.

#### THE STATE IN RELATION TO AGRICULTURAL ORGANIZATION.

In all these countries the State, which everywhere concerns itself with the business affairs of farmers, has been the chief agency in producing this result. The only difference is that in some cases it almost confines itself to the indirect means of an educational system so well designed to develop every side of the man that he conducts his business in the most intelligent way, and knows how to join with his fellows wherever it is to his advantage to do so. In other cases the State directly promotes co-operation and sees that the farmers are organised.

NEED FOR DEPARTMENT'S AID IN ORGANISING IRISH FARMERS.

In Ireland, unless this Department lends its assistance to the organisation of the farmer, agriculture will be hopelessly handi-

capped, and we shall utterly fail in our duty of starting the new peasant proprietary under favourable auspices. And furthermore, the greatest hindrance which stands in the way of the work of the Department and the County Committees in improving the methods of the farmers is that, unlike similar departments in foreign countries, we have to deal with individuals, and not with organised business associations. Therefore, I say to you that the farmers must be organized, and rapidly organized, and the only issue before you is by what means this change should be brought about.

#### ACTION ALREADY TAKEN BY THE DEPARTMENT.

Faced with this necessity, the Department has proceeded on several different lines. Recognising that there were between 800 and 900 associations of farmers already formed, most of them owing their existence and looking up to, as their guide upon questions relating to their organization, a society which exists simply for the purpose of promoting the principle we are discussing, the Department has acted as far as possible in conjunction with this voluntary body. Great confusion has existed in the public mind during the initial years as to the exact function of the Department, and this has caused some difficulty in securing an ideal division of functions between the Department and the Organization Society. All these matters will be very much more easy to deal with once this Council authoritatively accepts the principle that the farmers of Ireland must be organised. Then it will be for the Department, the Agricultural Board, and the Organization Society to work out a scheme of co-operation which will produce the maximum of result with the minimum of friction. You will, perhaps, say that I am begging the question as to whether the Department should itself undertake organization or should leave it to the Organization Society. Upon that question I have, myself, no doubt whatever. Organizing the Irish farmers is just as much an expert business as teaching them the sciences underlying their industry. At the former business I think I could qualify as an expert. At the latter business I certainly could not.

I have a hundred more things I should like to say, but you have too much, and too important, work to do. Fortunately Mr. Montgomery has provided you beforehand with just the kind of information which you require to show you what other Governments do for the farmers in the matter of organization, and what we must do or get done for them. I will meet only one objection, which really explains our backwardness in this vitally important matter.

## Co-operation in Relation to Trade.

It is feared that we shall injure trade. We shall do nothing of the kind. We shall immensely increase the volume of production and make a corresponding increase in the volume of consumption. Organised farmers are larger and more varied consumers than unorganised, and pay more promptly for what they buy. I have always discouraged general trading by agricultural co-operative societies as far as I could, but co-operating in the acquisition of agricultural requirements, and in the disposal of agricultural produce, immensely increases the funds available in the agricultural community for the acquisition of other commodities.

# MORTALITY AMONG SHEEP IN IRELAND.

WITH special reference to the recent Report of a Departmental Committee appointed by the Board of Agriculture and Fisheries to inquire into matters connected with the diseases of sheep known as Louping-ill and Braxy.

A heavy debt of gratitude is due from all flockowners for the valuable Report of the Committee whose work has just concluded.

During a perusal of the rather formidable looking three volumes which contain the Report, one scarcely knows which is the more noteworthy, the long sustained efforts of the investigators, which resulted in success after nearly four years of arduous research and experiment, or the patience of flockowners, who awaited the result of an inquiry of very serious importance to them.

Upon the result we may congratulate the Board of Agriculture, under whose authority the inquiry was held, the agricultural community who must reap vast benefits, and, most of all, the members of the Committee, not only for the successful issue to which they have attained but for the manner in which they have laid before the public an account of the work they have done, confidence being inspired as much by the candid recital of their early failures and mistakes, as by the success which ultimately crowned their efforts.

To record the steps in detail by which they proceeded would demand too much space, but the results of their investigations may be briefly summarised as follows:—

- The discovery of the cause of the disease known as Louping-ill, said cause being a germ.
- 2. A complete knowledge of the characteristics, habitat and mode of invasion of this germ.
- 3. A satisfactory, scientific means of protecting sheep against Louping-ill.
- Confirmation of the results of previous investigations by Drs.
   Hamilton and Neilsen (the former being Chairman of this Committee).
- 5 A means of protecting sheep against Braxy, similar to and equally effective as that for Louping-ill.
- Much interesting information respecting some other diseases of sheep, including Blackquarter, Struck, Malignant Œdema, and three other unnamed diseases,

Having had opportunities of obtaining experience of sheep diseases in the various sheep-raising districts of Ireland, I purpose offering some observations on this Report in its application to this country.

To persons not thoroughly conversant with the conditions under

Explanation of in the Past.

which stock-raising of all kinds is carried on in Ireland, it may appear to be a matter for Restricted Research surprise that in the past so little appears to have been done in the way of research into the nature, causes, prevention, and treatment of

diseases in sheep, and for this I think it not out of place to offer at least a partial explanation.

From the very nature of much of our land it is the case here, as in parts of Scotland that, throughout extensive districts, sheep-raising is the most important industry carried on by the occupiers of the land.

From time to time complaints have been made of serious loss from disease in sheep in certain parts of Ireland, but until the establishment of the Department of Agriculture there were practically no means of ascertaining the seriousness or otherwise of the losses complained of

In the early stages of their inquiry the Committee had evidence of this, so that we find in their report the following statement:-

"At the time when Professor Hamilton's paper was published in the transactions of the Highland and Agricultural Society for . . nothing was known of the prevalence of Braxy It could not be ascertained from veterinary surgeons even whether or not the disease existed in that country.

"Veterinary surgeons are seldom consulted with reference to diseases of sheep, and hence, probably, the want of knowledge which we found to prevail among them regarding this disease in particular.

"Through the kindness of the Department of Agriculture and Technical Instruction for Ireland, however, which we would ask permission to acknowledge, letters of inquiry were sent out by them over Ireland, with the result that practically all along the west coast Braxy proves to be endemic, and is, as in Scotland, one of the greatest obstacles to sheep farming as a profitable commercial undertaking."

While I must acknowledge the fact that the members of the veterinary profession resident in Ireland were not in a position to give the required information, the latter being principally obtained from "Scotch farmers resident in Ireland;" yet I can offer another reason for this

seeming dearth of knowledge and neglect of research among veterinarians. The fact is that Ireland has large areas in which no veterinarian can be found, there being only three hundred in the whole country, and in many of those districts, among which may be included some of the chief sheep-raising localities, it is not probable that, if present, a veterinarian could subsist on the proceeds of private practice.

Thus, in the south-west, where I learn from the report of Mr. Harper, late instructor under the Congested Districts Board, that the diseases under consideration are prevalent, there is an enormous area quite unprovided with veterinary surgeons, though it includes the important towns of Skibbereen, Roscarberry, Dunmanway, Bantry, Macroom, Millstreet, Kenmare, Glengariffe, Caherciveen, Killorglin, Castlemaine, and Castletown-Berehaven.

Another district, in which from my own personal knowledge I can say the diseases are more or less prevalent, lies between two imaginary lines, one from Ennis to Nenagh on the south, and the other from Tuam to Ballinasloe on the north, and is without a resident veterinarian nearer than the towns mentioned.

It is easily conceivable, therefore, that diseases might exist for a considerable time in these districts without coming under the notice of the nearest veterinarians who happen to number among them, in this instance, some of the most eminent members of the veterinary profession resident in Ireland.

Similar remarks might be made with regard to other districts, such as North Leitrim, where, on the occasion of my last visit, no veterinarian resided, the same being true of the greater part of county Donegal and very many other districts.

When it is realised, therefore, that throughout the greater part of the sheep-raising parts of Ireland the services of a veterinarian may be said to be practically not available, it is not a matter for surprise that the members of the veterinary profession had little information to offer in reply to the inquiries mentioned in the Committee's Report.

I should like here to correct another statement in the paragraph of the report which follows the one previously quoted. It runs as follows:—

"So far as our inquiries extend, they indicate that it (Loupingill) does not seem to be known on the east coast of Ireland, or, if it crops up at all, does so sporadically, and not in the widespread manner assumed in the west." If the evidence of residents, both Irish and Scotch, all interested in sheep-raising, may be taken as trustworthy, it will be found that, in at least one eastern county—Wicklow—the disease is met to a very serious extent. One gentleman, Mr. Alfred Darley, has, for several years, gone to considerable expense and trouble in his efforts to combat this disease, and, at his request, in conjunction with Mr. Thomas D. Lambert, Veterinary Surgeon of Dublin, I have had opportunities of seeing cases of the diseases on which the Committee report. Investigations have also been conducted for the Department of Agriculture and Technical Instruction for Ireland.

Among many others, from whom I have received information in county Wicklow, I may mention the Rev. Walter Rossiter, P.P., of Tinahely; Mr. Michael Fleming, M.C.C., of Shillelagh; Mr. J. J. Reilly, near Newtownmountkennedy; Mr. L. Murphy, of Togher; and Mr. F. Buckley, of Enniskerry.

The Agricultural Instructor for county Wicklow, Mr. A. Nolan, has given me much assistance in my inquiries, and, from all these various sources, there is a consensus of opinion that the loss from these diseases in county Wicklow has been, in some years, very serious.

Mr. Darley, speaking from his own personal experience, said that many farmers, in one part of the county, have been absolutely ruined from this cause.

By personal observations, and from reports from other persons, I

The Diseases occur in have obtained information as regards the
various parts of diseases recently investigated by the English
Ireland.

Committee, from various parts of Ireland.

From Connemara I received interesting reports from the Reverend Father Flatley, P.P., and Mr. Michael B. King, D.C., both of Leenane; Mr. Michael Hogan, of Loughrea and Mr. M'Donald, of Louisburgh, county Mayo, also giving me much interesting information during my visits to their counties.

The counties which seem to be most seriously troubled with these sheep diseases are—Wicklow, Galway, part of Roscommon, Mayo, Donegal, Kerry, and part of Cork, with sporadic outbreaks in county Dublin.

Throughout the sheep-raising districts of Ireland two principal diseases are recognised as being the chief cause of excessive mortality in sheep—wherever this occurs—these being recognised respectively as Braxy, which, in certain districts, is known as "Redwater," or, over a limited area as "Whitewater," and Louping-ill, which is known as "Trembles," or "Shivers."

These diseases differ so widely in symptoms, course, time of year and age of animals affected, that I have never seen

Braxy and Louping- any tendency to confound them, and I must confess to some surprise at first when I noted the manner in which they have been thrown together in the Report under review.

The following are among the most obvious points of difference between these two diseases as met with in Ireland.

Braxy occurs chiefly during the early winter—in fact, in many districts, it is held that its first appearance, coincides with the first white frost.

Lonping-ill, which is not so common as Braxy in Ireland, occurs chiefly in the Spring.

Braxy only attacks the lambs of the previous season, i.e., animals from nine to fifteen months' old.

Louping-ill is met with in sheep of all ages.

In Braxy the onset of the disease is sudden and death occurs soon after the first symptoms are noticed, in fact, in very many cases, the first intimation received is the news that a lamb is found dead, many holding that the best lambs, as regards condition, are most liable to attack.

In Louping-ill there is, generally, full opportunity of noticing the progress of the disease, and, occasionally, it runs a somewhat chronic course, cases of recovery being not unknown, but near Gort, in county Galway, where I found the disease prevalent, some years ago, I was told that "Wryneck," or some nervo-muscular affection, generally remained as a sequel in recovered cases.

The post mortem appearances also differ widely, as follows:—In Braxy Irish shepherds describe enormous distension of the carcase with gas, which escapes on opening, with strong odour, the abdomen being found to contain more or less fluid, which is frequently red, though, on occasions, it is light in colour, or even clear, hence the names Redwater and Whitewater. The stomachs, bowels, and even the tissues of the abdominal wall, it is said, may be also stained red, while there is a darkening of the lining of the true stomach and sometimes of the bowels.

From the post morten examinations I have had the opportunity of making, I can support the general accuracy of these statements.

In Louping-ill the post-mortem appearances do not, according to the same persons, possess any marked characteristics, except the remarkable rapidity with which putrefaction sets in, and, in this disease, also, there is great distension of the carcase.

Coming now to the attempts which have been made at prevention, I

Attempts at prevention cannot say that I have been satisfied with the
of the Diseases efficacy of any of the methods hitherto adopted
not satisfactory. in Ireland, except the removal of susceptible
animals from infected lands before the usual season for the appearance
of the disease.

Thus, in the case of Braxy, it is found that, if part of a flock of lambs be brought down from Wicklow mountains to the lowlands of Dublin and Meath in September, and the remainder of the flock be allowed to remain in county Wicklow highlands, Braxy will not appear in the former, while its ravages in the latter may be serious. Some experiments in the matter of prevention have been made by individuals, but not in a systematic manner. Thus, in county Wicklow, recently, one person has inoculated a number of sheep against Anthrax. Since Nielson, however, in 1888, decided that Anthrax and Braxy were in no way related, and since Anthrax is a very rare disease in sheep in the British Islands, I am not hopeful of much good resulting from these inoculations.

For some years I have held and taught that many cases of so-called

Inoculation and
Dipping as
Preventives.

Braxy were in reality cases of Blackquarter, and have suggested inoculation as a preventive of one form of the disease.

The adoption of this plan is said to have reduced the mortality in some districts during the past two seasons, but the conditions under which the experiments were carried out prevent my being fully satisfied that the immunity which was apparently conferred was attributable to the inoculation.

As a preventive of Louping-ill I have known some of the better informed farmers, who had acted on the teaching of the late Professor Williams, as to the agency of the tick as a means of conveying the disease, to use dips as a preventive, but not with success, so far as I could learn.

As regards the mortality from these diseases, it is not easy to obtain

The Mortality from these Diseases.

anything like accurate figures; but allowing for exaggeration, I am convinced that in some years it has been very great in Ireland.

Father Flatley and Mr. King report that in their part of Connemara the average losses amount to thirty or forty per cent. in bad seasons. Mr. M'Donald informs me that in his part of county Mayo the percentage of deaths from Braxy alone varies from twenty-five per cent. among native lambs to forty-five per cent. among imported ram lambs, of which he brings over about one hundred from Scotland annually.

Father Rossiter, from information which he kindly collected for me in his part of county Wicklow, says that among the hills from thirty to seventy per cent. of the young sheep are attacked by various diseases of which he gives symptoms. From these symptoms I suspect most of the cases to be due to either Braxy or Louping-ill, and of those attacked from seventy to ninety per cent. die.

It is, I think, sufficiently obvious from a consideration of the foregoing that such a Report as that just issued

Further Experiments should be welcomed by all interested in the possibly necessary. rearing of sheep in Ireland, while at the same time to prevent disappointment careful consideration is demanded with possibly further experiments before the happy conclusion is arrived at, that we now have at our hand a means of putting an end to the mortality among our flocks in Ireland.

The Committee, the members of which were appointed for a definite purpose, have carried out the work for which they were appointed, viz., "to inquire into the ætiology, pathology, and morbid anatomy and other matters connected with the diseases of sheep known as Louping-ill and Braxy."

In the matter of those two diseases they have obtained most valuable information and practical results, but unfortunately they have removed one source of uneasiness only to give us another.

They have proved, what many of us suspected, that what were long looked upon as two diseases, really included a number of diseases, and so, though we may now hope to adopt satisfactory measures for the prevention of Braxy and Louping-ill, yet we are as yet by no means certain here in Ireland that these are the chief sources of the trouble.

The inquiry cannot be allowed to terminate as it stands at present, as we are now brought to a point of great importance, not only to those interested in diseases of sheep, but also to those who desire knowledge of disease in other animals.

Thus—if, as many suppose, Blackquarter in sheep is often confounded with Braxy, many will expect that from analogy with bovine Blackquarter the subcutaneous inoculation, as practised in calves, will be an efficacious system for the prevention of this disease in sheep; while, on the 9ther hand, it is possible that the administration of cultures

of pathogenic organisms by the alimentary tract, may be found satisfactory in cases where the subcutaneous method has alone been hitherto used in other animals.

One great advantage would be that such administration would not require the attendance of an expert, but a danger suggests itself, which may make it necessary to prevent the indiscrimate issue of cultures of pathogenic organisms, viz., the spreading of the disease to pastures and districts hitherto unaffected by the diseases in question.

For the present therefore, it would not appear to be wise to allow

Use of new be in expert hands only.

the application of the newly discovered prophylactics to pass out of expert hands until, by Prophylactic should further experiment, it can be ascertained how long a period of quarantine must be enforced before sheep, which have received the protective dose, have been cleared as to their intestines of

the infective organisms.

Otherwise it is conceivable that diseases would be introduced to districts previously free from said diseases by the soiling of pastures with the excreta of sheep whose intestines have been charged with the pathogenic organisms, by the administration of cultures as a preventive of the diseases.

In support of the necessity for caution in this matter, I may mention that I have been repeatedly told by persons of mature years that the diseases in question were unknown in Ireland forty years ago. a report from Connemara states :-

"The staple breed of sheep is the blackface, and it has been such for thirty to forty years, when it was first introduced from Scotland. Before that the general breed was a diminutive type of the Roscommon, which is said to have been entirely free from disease."

Again, I was told that a certain nobleman lost one hundred and twenty sheep from Louping-ill out of seven hundred imported, and his land, which had been previously free from this disease, was, at the time of my visit, considered to be badly infected.

The whole Report is so fascinating in its mixture of sound practical work with the evidence of the splendid pathological and bacteriological research which must be expected in any inquiry with which Dr. Hamilton is connected, that it is with regret I am compelled, by limits of space, to confine myself to an abbreviated edition of the Committee's own Summary of Conclusions.

Parts I. and III. of the Report will repay perusal by a layman; Part II. however, contains matter which must be of interest to even those most profoundly learned in matters pertaining to bacteriology and pathology. Indeed it does not appear that the Committee exaggerate, when they say on p. 329—

"From a pathological point of view the side issues which have cropped up, are a perfect mine of wealth, are fraught with scientific problems of the highest interest and importance, and are most suggestive of what may turn out to be a new light on the pathology of many of the contagious and infectious diseases of man and the lower animals."

# LOUPING-ILL (Chorea Paralytica).

GENERAL SUMMARY OF CONCLUSIONS OF COMMITTEE (Abbreviated).

- 1. The disease prevails mostly along the West Coast and South of Scotland and the North of England, probably also along the West Coast of Ireland. It does not appear to be recognised as yet in countries other than the British Isles.
- 2. Early symptoms are dulness, reeling gait, followed by trembling or more violent movements, terminating in more or less paralysis of the extremities. Duration, if acute, three to four days, more usually from one to five or six weeks.
- 3. The mortality in badly infected districts runs from ten to fifty per cent., and always highest when sheep are shifted from land free from the disease (clean) to that where the disease is present (foul).
- 4. The carcase shows no marked results of the disease, except gas in the abdomen, and small spots along the course of the intestine. Usually a fairly abundant quantity of fluid in the abdomen, which is sometimes clear, sometimes turbid.
- 5. The germ which is the cause of the disease is found in the intestine and in the abdominal fluid. This germ is not found in other parts. It is of large size, comparatively, has a coarse appearance and spores prolifically, the spores being relatively large, oval, and brown in colour. The organism is a strict anærobe, and is usually found in enormous numbers in the intestines and in cases where the abdominal fluid is turbid, the latter also contains large quantities. In cases where the fluid is clear it may not, at first, be recognisable, but develops luxuriantly on being incubated at 37° C. to 38° C.
- 6. The organism can be inoculated on the sheep when injected under the skin or administered by the mouth to susceptible animals, and, when it has established itself on the tissues and liquids of the body, always kills the animal in from eighteen to forty-eight hours.

- 7. The organism—a bacillus—contains its own poison, which is not found in the liquid in which the bacillus is grown. The bacillus finds its way from the intestines into the blood, where it is dissolved, and its poisons, set free, acting on the spinal cord, and thus accounting for spasms and ultimate paralysis.
- 8. The organism is, essentially, intestinal in its habitat, gaining entrance with the fodder. Ticks, as infecting agents, may be put out of count.
- 9. The dung of affected animals provides the chief source of contagion, but contamination may, to some slight extent, be spread by carrion-eating birds which feed on the carcases of affected animals.
- 10. Several years freedom from sheep would be necessary to remove risk of contagion from land which has become thoroughly contaminated.
- 11. Louping-ill reaches its acme in the Spring months, though occasional cases are met at other seasons. During the Louping-ill season the blood is less powerful to destroy the germs, so that the latter gain access from the intestine to the blood or lymph. The organism finally germinates on the abdominal fluid, after which the animal soon dies.
- 12. There are seasons of the year when sheep are not susceptible to the disease, and, by taking the organism into the system at this time, the sheep becomes "seasoned" and is immune against the disease.
- 13. The preventive treatment, therefore, is to administer the germs at a time when the sheep is not susceptible.
- 14. Injection under the skin was found to be dangerous and otherwise unsatisfactory.
- 15. Administration by the mouth is satisfactory and can be carried out by unskilled persons.
- 16. The preventive consists of the bacillus grown on glucose-beef-tea from spores contained in the peritoneal (abdominal) fluid of an animal dead of Louping-ill, and this, mixed with a little water, is administered by the mouth, on two occasions, with an interval of a week to ten days between them, and in the month of January.

# BRAXY (Morbus Subitarius Ovis).

GENERAL SUMMARY OF CONCLUSIONS OF COMMITTEE (Abbreviated).

- 1. This disease is found in Scotland, in the North of England, part of Ireland, in Iceland, Faroe Islands, and Norway.
- 2. Like Louping-ill, it is a seasonal disease, the late autumn and early winter months being those in which it prevails.

- 3. The disease comes on suddenly, and death usually within from twenty-four to thirty-six hours after the first signs of the disease. The symptoms are—faltering gait, dulness, inclination to isolate itself, in a few hours collapse, and death.
- 4. Owing to confusion with other diseases, it is probable that the mortality is exaggerated, though, undoubtedly, enormous. True Braxy is commonest during December and January, ceasing generally by the middle of February.
- 5. As in Louping-ill, the germ is, probably, at first intestinal and kills the animal by getting over into the peritoneal cavity and blood. The peritoneal fluid in animals dying of this disease swarms with the organism of the disease. The same remarks apply to the germs which cause the other diseases frequently confounded with Braxy. These germs are all anærobic and have a greater or less tendency to spore.
- 6. The carcase becomes rapidly blown up with gas. The flesh is much blood stained, the peritoneal fluid abundant, opaque, and coloured with liberated blood pigment. The odour in Braxy and these other diseases is characteristic.
- 7. The organism is a fairly, but not extremely, large rod, with a delicate outline, and, as a rule, quite motionless. It spores very freely and does not take Gram's reaction.
- 8. As in Louping-ill there are seasons of the year when the sheep's blood can destroy the organisms and so Braxy, like Louping-ill, is seasonal in its character.
- 9. Only sheep, naturally, take this disease, while the other animals are sometimes affected with Louping-ill.
- 10. During the susceptible period the disease can be re-produced, either by inoculation or by administration through the mouth.
- 11. The disease is spread by the dung of affected animals and by exposed careases of animals dead of the disease. The germs are taken up by the sheep when feeding, and, if at a time when the animal is not susceptible, the latter is henceforth protected against the disease, but, during the months when the animal is susceptible, their ingestion will lead to disease and death in animals not already protected.
- 12. The same immunity is obtained by administering cultures of the germs by the mouth during August.
  - 13. Subcutaneous inoculation is impracticable and dangerous.
- 14. Administration of cultures of the Braxy bacillus only secures immunity against Braxy and not against the other allied diseases,

We are thus brought to what appears a satisfactory conclusion so far
as one can judge after a careful perusal of the
Reliable Preventives Report of numerous experiments performed.
claimed to have The outstanding fact, which will probably be of
been found. chief interest to sheep-raisers, is that the Committee claim to have found a thoroughly reliable

preventive in each of the two diseases—Louping-ill and Braxy.

Whether the same success will attend their use in Ireland remains to be seen.

Mention has been made of other diseases which obtruded themselves on the notice of the Committee during their investigations, and they expressly state that immunity against these diseases is not obtained by the use of cultures of the Braxy bacillus. So far we have had no means of knowing if these diseases exist in Ireland, or if we suffer from Braxy and Louping-ill only of this group.

The results of the actual experiments at preventive administration of germ cultures warrant us in accepting so much of the Committee's Report as refers to the use of this form of prophylactic, but it remains to be seen if the scientific world will accept the observations, confessedly incomplete, on the bacteriolytic capacity of sheep's blood. With this however, flockowners will not greatly concern themselves, if satisfactory practical results are obtained from the Committee's conclusions.

While discussing methods of prevention, I cannot refrain from mentioning a subject to which the Committee gave "Pig-dung Treatment." considerable prominence in their Report. I refer to the so-called "pig-dung treatment."

To me it appears a matter for regret that such is the case. On the strength of what was confessedly an insufficient number of trials, carried out, so far as the Report shows, without adequate controls, the Committee venture to draw certain deductions, for recording which so fully it is hard to see the necessity or even justification.

It is not suggested in the Report that the Committee were influenced as to the nature of their experiments by the reputed success of this method of prophylaxis.

If their scientific experiments were conclusive, corroboration was unnecessary, and when taken from such a source a dangerous precedent is created.

In Ireland we have many such preventives and cures, and one of the objects of popular lectures is to combat such "quackery." If, with the authority of an important departmental Report, the idea gains ground that probably under the empirical remedies of ignorant persons, there may be a sufficient substratum of truth to warrant their perpetuation, it will become increasingly difficult to persuade the small farmers in many districts of Ireland to cease such cruel and senseless operations as that for the treatment of the so-called "worm in the tail," of cattle, or the barbarous removal of the clitoris, so freely performed in certain districts, in a most painful manner, for the prevention of abortion in cattle and mares.

The other diseases which have been several times mentioned, and which are described in the Report as belonging

Other Diseases in to the same group as Braxy and Louping-ill are the following:—Blackquarter, Struck and "Malignant Œdema of the sheep," with two others not previously recognised, and in the report designated Disease "A" and Disease "B."

These, together with an allied disease in the deer, are, according to the Report, all of intestinal origin, each being caused by an anærobic bacillus having specific poisonous effects, while the various bacilli have evidently a close mutual relationship.

As the Committee only obtained evidence that these diseases prevailed along with Braxy during 1904-5, they had no opportunity of trying measures for their prevention, but they state that they have confidence in asserting that they might be treated upon the same principles as those found to be so successful in contending with Louping-ill and Braxy.

Summary of present knowledge of the Diseases.

Summary of present control of the Diseases.

Now the sum total of our knowledge of these diseases as applied to this country in the light of the recent Report of the British Departmental Committee.

- 1. In several districts in Ireland considerable loss from time to time is caused by certain diseases of sheep, chief among which are Braxy and Louping-ill.
- 2. Braxy attacks young sheep from nine to fifteen months old, while Louping-ill appears at all ages.
- 3. Braxy appears chiefly from October to February, inclusive, December and January being the worst months; while Louping-ill occurs most frequently in spring.

- 4. In cases of Braxy death occurs within a few hours after the animal is noticed to be unwell; while in Louping-ill the patient may linger for days, and occasionally recovers.
- 5. The cause of Braxy is a germ which is picked up on the pasture (where it may exist for months or years) with the food.
- 6. The germ will only cause the disease during the months from October to February, inclusive, at all other times the sheep's blood being capable of preventing its action.
- 7. If the sheep picks up the germs during the period of the year in which it is not susceptible to Braxy it will be protected against the disease during the following autumn and winter.
- 8. The same protection is afforded by drenching the animal with a fluid containing some of the germs which can be specially cultivated for the purpose.
- 9. The cause of Louping-ill is another germ which is in many respects similar to that of Braxy, and the same statements hold good with regard to Louping-ill as are made in paragraphs 6, 7, and 8 above with regard to Braxy. It is no longer held that the tick plays any important part in the spread of either Louping-ill or Braxy.
- 10. There are some other diseases which cause loss, and which resemble the two already mentioned in some respects, but our knowledge of them is not complete.
- 11. It will be well, for a time, if giving a trial to the drenches suggested in the Report as preventives of Braxy and Louping-ill, to do so under expert guidance, as otherwise the disease may be spread to districts where it has not hitherto been known.

The Committee conclude their Report with three suggestions—one with regard to publishing the conclusions arrived at, the second, "that facilities be given for the universal drenching of sheep against Louping-ill and Braxy, where these diseases prevail," and the third, recommending that further opportunities of investigation be given.

As already stated, it is by no means certain that it would be advisable to adopt the second suggestion unreservedly, but with the third every person who reads the Report must be in hearty agreement.

FALKNER C. MASON.

# HOME BUTTERMAKING.

The chief thing to be remembered in buttermaking is that cleanliness must be practised throughout. It is not meant that the dairy and its fittings should receive periodical spring cleaning, but that strict cleanliness be the rule every day in the year. Without cleanliness no pasture, cows or dairy, no matter how up-to-date, can result in the production of good butter; whereas with strict cleanliness and sanitation excellent butter may be made in indifferent dairies and with the most old-fashioned appliances.

Milk may, and often does, receive taints during the process of milking which cannot be removed by any subsequent Milking. The cow-house should not be cleaned out while the cows are being milked, nor fodder disturbed at this time. Feeding is best done either before or after milking. Dirty udders must be washed or well wiped with a damp cloth before milking begins. The hands of the milker cannot be too clean and should be washed or rinsed after milking each cow;

damp cioth before milking begins. The hands of the milker cannot be too clean and should be washed or rinsed after milking each cow; the habit of dipping them into the milking pail or wetting them by milk from the udder cannot be too strongly condemned. The first jet or stream of milk from each teat should be allowed to fall on the ground. Milk from an inflamed udder or teat should be drawn into a separate vessel and fed to pigs. Milk from freshly-calved cows should not be used for butter-making until it has assumed the character of ordinary milk. Clean, quick milking is most important if the milking capacity of the cow is to be maintained and the full yield of butter fat obtained.

The milk of each cow should be strained directly it is milked through a fine wire strainer or four folds of muslin or straining cloth. This immediate straining is most important, as without it many particles of dirt would have become disseminated through the milk before it reaches the dairy. The milk should be removed from the byre as quickly as possible.

Where pans are used for cream raising, the most suitable are those stamped from one piece of tinned steel, having Cream Raising. the same width top and bottom. The milk should be set while warm from the cow without any previous cooling. Milk should not be cooled before setting, as this prevents the cream from properly rising. The object of such cooling is to keep the milk sweet, but the same result can be brought about

without lessening the yield of cream by only half filling the pans and placing them a wider distance apart on the shelves. The less cooling the milk gets before setting and the more quickly it is cooled afterwards the better the yield of cream.

Both in summer and winter the pans should be skimmed at the end of twenty-four or thirty-six hours. No more cream skimming. Will be obtained after this time, and the flavour of the butter is injured if the milk is allowed to stand unskimmed for days, as so commonly happens, especially in winter. When skimming, as little milk as possible should be removed with the cream.

In case a separator is used, care should be taken that it is clean and well oiled each time of working, and that the proper speed is attained before any milk is allowed to flow into the bowl. The instructions issued with

the machine should be carefully followed. The milk should be separated as soon as possible after being drawn. The thickness of the cream can be regulated by the cream screw which is found in the bowl of all separators. For butter-making purposes, cream of a suitable consistency is yielded when one quart is produced from about eight quarts of milk. During summer, after the cream has been received from the separator it should be cooled by standing the cream vessel in cold water until the temperature of the cream is as low as the water will allow. It may then be mixed with the cream previously separated. A very bad and widespread practice is that of placing the cream vessel under the separator morning and evening, and allowing the fresh cream to mix with that already souring. After all the new milk has run through the separator a little of the separated milk or warm water should be put through the machine to remove all trace of cream from the discs and pipes. It is essential that a separator should be kept perfectly clean, as butter of good quality cannot be made from milk run through a dirty machine.

Much of the bad butter made can be traced to mismanagement at the ripening or souring stage. The most com-Cream Ripening or mon faults are:—

Souring.

1. Allowing the cream or milk to stand too long before churning. If this is altogether overdone cream may completely fail to churn.

 Keeping cream or milk while souring in unsuitable places, such as bedrooms, or in a dairy with cabbages, onions or other strong-smelling substances.

- 3. Neglecting to stir the cream at intervals so as to prevent the formation of a scum on the surface.
- 4. Keeping in too cold a place in winter; this often gives a bitter flavour to the butter.

All cream or milk intended for churning should be kept in a tinned vessel or a glazed earthenware crock, free from cracks. A galvanised bucket is not suitable, and a wooden tub is too troublesome to clean thoroughly.

The windows of the room where the cream or milk is ripened should be kept open, if necessary covering the cream vessel with a piece of muslin to exclude dust. Good ventilation in the dairy is essential to good butter-making.

Cream should be well stirred morning and evening with a hard, smooth stick kept for the purpose. No unsoured cream should be added for twelve hours before churning, which may, as a general rule, take place on the third day in summer; this, however, to a large extent depends upon the weather. For example, in hot, sultry weather the cream may be ready for churning on the second day, whereas in winter it may be kept with safety for four or even six days. Cream is ready for churning when it has acquired a slightly acid taste and is fairly thick and smooth. If allowed to stand many hours after this stage of ripening the quality of the butter suffers. In winter the temperature is so low that unless the cream is heated the process of ripening is unduly retarded.

When the first lot of cream is skimmed or separated, the temperature should be raised to 70° F. by placing the cream vessel in a tub of hot water, keeping the cream continually stirred. A little fresh buttermilk from the previous churning should be added, say, half-pint to a gallon of cream. The temperature of the cream during ripening requires to be maintained as near 60° F. as possible, either by repeating the heating process or by placing the cream vessel in a warm room. Each fresh lot of cream if below 50° F. in temperature should be heated before being added to that already ripening. To ensure proper ripening the temperature should not fall below 60° F. in winter.

The evening's milk should be allowed to cool before being mixed with
that of the previous morning. In winter it is
Churning of Whole desirable to hasten the souring as in the case of
Milk. cream. Whole milk sours very rapidly in
summer, and, as a general rule, should be
churned at the end of one day's ripening. Milk also requires to be
stirred at intervals during ripening.

The temperature at which churning takes place is of great importance.

Temperatures for grain small and difficult to deal with. If too high, the yield will be less, a large proportion of the fat going off with the buttermilk. The temperature should never be raised by pouring hot water into the cream or milk. Cold water, if good and pure, may be added to lower the temperature when necessary. In hot weather it is difficult to obtain a sufficiently low temperature unless the churning is done in the early morning.

Suitable temperatures for churning.

Summer—Cream, .		54° to 58° <b>F</b>
Whole Milk,		62° to 66° F
Winter — Cream, .		58° to 63° F.
Whole Milk,		66° to 70° F.

Good butter may, by proper management, be made in any class of churn. In order to prepare a churn during summer it should be rinsed with cold water, scrubbed with salt, and rinsed again with cold water. In winter it should be scalded with hot water and rinsed with cold. At all seasons after the butter has been removed, the churn should be well washed with warm water, scalding with boiling water, and left to air. The same method of preparation and cleaning equally apply to all makes of churns.

If an air-tight churn is used, such as an "End over End" or barrel churn, it should be ventilated frequently for the first ten minutes. If this is not done churning will be prolonged. In summer, when the butter appears like wet Indian meal, add a little cold water, and in winter add water at a temperature of 65° F. Stop churning when the butter is as large as good-sized shot.

Some of the most common causes of failure to obtain butter are as follows:--

- Neglecting to ventilate air-tight churns;
- 2. Over-ripening or under-ripening of the cream or milk;
- 3. Churning with too high or too low a temperature;
- 4. Over-filling the churn;
- 5. Cream obtained from the milk of cows all of which have been a long time in milk.

Washing of Butter. the churn—using only as much water for each washing as will float the butter. After the water has been added the lid should be put on and the churn turned round a few times. As a general rule two washings will suffice, but in very hot weather three washings may be necessary. In the case of an old-fashioned churn the butter should be lifted from the buttermilk with a scoop and washed in a tub, using the scoop to stir it about in the water. Great care should be taken not to overwash butter, as this destroys the finest flavours. In summer the coldest well water available should be used for washing. In winter it will be necessary to raise the washing water to a temperature of from 50° to 55° F. This makes the

butter more easily worked.

ance of even the best-made butter.

Whether a butter-worker or a tub is used, the salting should be done immediately the butter is washed, without any Salting and Working previous working. Only the best quality of Butter. dairy salt ought to be used, and it should be dry and finely ground. The amount of salt will depend upon the requirements of the market. "Slightly salted" butter should have 1 oz., " mild cured," 1 oz., and "salt" butter ! oz. of salt to every pound of butter. For every six pounds of butter an extra ounce of salt should be added to allow for drainage. If a butter-worker is used, and when not more than 1 oz. of salt has been added to each 1b., the butter may be rolled out six or eight times. Where heavy salting is practised extra working must be given in proportion to the amount of salt used. This is necessary to prevent streakiness or unevenness in colour.

In hot weather, when the butter is soft, it is advisable to place it, after the salt has been added, in a cool and draughty place to "firm," and to finish the working early the following morning.

should be used, and when made up, each roll

Making Up and should be wrapped in parchment or "butter paper" previously damped to prevent it sticking. Butter ought never to be taken to market wrapped in cabbage or rhubarb leaves. The basket should be lined with a clean white cloth. When exposed for sale butter should not be placed in the sun, as this not only spoils the flavour, but also the appear.

Firkins or boxes should be well scrubbed with hot water and steeped for a short time in hot pickle, cooled and lined with butter paper previously soaked in brine. This steeping is done with the object of removing the woody taste which the packages would otherwise impart to the butter. In packing, the butter should be well pressed down round the edges or corners, finished off smoothly, and covered over neatly with butter paper as at the bottom. For further particulars as to the packing of butter see the Department's leaflet No. 60—The Packing of Butter.

Pans, vessels, separator discs, and other utensils, may be best cleaned by first being washed with a brush in tepid water,

Cleansing of Utensils. then scalded with boiling water, and without further treatment placed on a drying-rack exposed to sun and air.

A new churn should first be washed with tepid water, well scrubbed with salt, then washed with hot water several times

Preparation of a until the water comes away quite clear. Hot pickle should then be allowed to stand in the churn for a short time; then after rinsing again with hot water it should be left to air for at least one day before using.

# THE PLACE OF SCIENCE IN A GENERAL EDUCATION.

Based on a Lecture delivered on the 11th July, 1906, as the first of a series in connection with the Department's Scheme of Short Summer Courses for Teachers.

It may be remembered that on a similar occasion to this, nearly a year ago, it was my privilege to address you on the subject of " Method in Science Teaching." To-day my theme is a wider one. Just as an artist steps back from his work to examine it from a distance and judge of its proportions and general effect, so should teachers from time to time take a wider survey of their work and inquire the end and purpose of the several parts of the structure they are attempting to raise. Such a course seems peculiarly desirable in regard to a subject such as Science whose claims to a definite position in a general education are coming, though tardily, to be recognised. These claims, strong though they are, cannot be maintained unless teachers of Science clearly realise the end and aim of instruction in Science and the relation such instruction bears to the three main branches of a general education. It is necessary at this point, however, to still further extend our survey and again inquire, "What is the end and aim of all education?" The question has been often asked, and as often answered—at all events so far as its broad tendencies are concerned. But changing social conditions invest the question with a new significance every time it is raised.

Perhaps the chief aim of education could scarcely be more tersely or comprehensively stated than in the words of The Chief Aims of the German poet philosopher Goethe: " Im . Education. Ganzen Guten Wahren resolut zu leben"-to live resolutely in the whole, the good and the true. educationist, while he may readily admit this, requires a fuller analysis. One of our greatest Nineteenth Century Philosophers has stated very clearly the aims of education. Herbert Spencer thus summarises these aims: "The essential question for us is: How to live? Not how to live in the mere material sense only, but in the widest sense. The general problem which comprehends every special problem is the right ruling of conduct in all directions under all circumstances—in what way to treat the body; in what way to treat

the mind; in what way to manage our affairs; in what way to bring up a family; in what way to utilise all those sources of happiness which nature supplies—how to use our faculties to the greatest advantage of ourselves and others—how to live completely? And this being the great thing needful for us to learn, is by consequence the great thing which education has to teach. To prepare us for complete living is the function which education has to discharge; and the only rational mode of judging of any educational course is to judge in what degree it discharges such functions."

This statement of the aims of education, however, though helpful

Changing Conditions.

and inspiring, will not carry us far in the drawing up of curriculum, or as to the best methods in which to teach its subjects. But while there cannot, I suppose, be any great difference of

opinion as to the aims of education, there is the greatest diversity of opinion as to the means by which those aims are to be obtained. There are books without number on education; but their influence becomes practically negligible before a government code or an examination system, especially when codes and systems are buttressed by grants from public funds. Now codes and systems are inevitable and essential, but must change with changing conditions. Too often they lag behind these social changes. Let me explain more clearly what I mean. feel very strongly that education systems during the last thirty years at all events, have had too little regard to the status of those being educated. We must not forget that education is a life-long business, beginning with the cradle and ending with the grave. Before the passing of the Elementary Education Acts of 1870 the great mass of the population received the whole of their education outside schools. were taught morals at home and at church, and they learned their craft -and usually learned it very well-during a long term of apprenticeship. Thus, School and College education was for the few, and was directed to a preparation for the learned professions. With the passing of the Elementary Education Acts, however, when opportunities were given to every child, however poor, to obtain an education in a public Elementary school, the nature and aim should have been changed. Unhappily we have not yet sufficiently differentiated between the education necessary to fit a youth for the work in life to which he will in all probability be called and the education which is to lead to what we may call Scholarship. I would not withhold from any youth of conspicuous ability the opportunity to rise to the top of that educational ladder of which we have heard so much. But is it not possible that we have allowed too much to our geniuses and in seeking for them have sacrificed many of those who were made of good enough material for the every-day work of life, but of a material which could not receive the high polish of the scholar.

It is necessary here to guard against two extremes. The first of them assumes that a youth is born to a par-Two Extremes to be ticular status in society and must remain avoided. there.

The other point of view does not stop at giving the legitimate opportunities to poor boys of ability, but consciously or unconsciously educates many a boy out of a position in which he might serve his neighbour. and into one he may never fill with profit.

My belief is then that we have not sufficiently considered in our educational system the future of those we educate. A defect in present and the consequence is that in too many cases Educational System. we have unfitted the youth for the only position in life which he might occupy with credit to

himself and advantage to his neighbour. It has had the effect in too many cases of removing the youth from the country to the town, and from the honest craft to an occupation more genteel, but perhaps no more creditable, and this state of things arises in part at least, to quote the words of Thomas Huxley, from "the mischievous delusion that brain work is in itself, and apart from its quality, a nobler or more respectable thing than handiwork." Such education may be a deadly mischief to the workman, and lead to the rapid ruin of the industries it is intended to serve.

A dispassionate survey of the field of primary education shows still. I

tion and Executive powers should be trained.

venture to say, a great neglect in the training Faculty of Observa- of a large part—and that certainly not the least important part-of one's nature. I frankly admit the fundamental importance of the three R's, but we are apt to forget that the three R's are only a means to an end. They are the tools by

which a great work may be accomplished, but alone may be an instrument for evil as well as for good. I am not here, however, dealing with the general question of educational reform, but only making a plea for the widerintroduction of forms of instruction which will lead to the training of the faculty of observation and the executive powers. Broadly speaking these forms of instruction consist of Science, Drawing, and Manual I do not suggest that such training may not be secured by other subjects; indeed I have strongly urged the great value of geography when taught on rational lines, but I regard the subjects I have mentioned as most important yet neglected elements in education. I shall confine myself, however, to the use of Science as an instrument of education. As taught for many years, the inclusion of Science in the general education could hardly be defended. The aim—if conscious aim there was—seemed to be to convey in the form of didactic instruction some of the ascertained facts of Science, and the possession of those facts was usually decided by means of a written examination. Let us, however, inquire what the principal functions of a well designed course are. I do not know that I could express these more briefly than by quoting from the Prefatory Note to the Department's Programme for Day Secondary Schools. They are:—

- (1) The education of the power of observation, involving the exercise of judgment and the training of the senses.
- (2) The training of the reasoning powers.
- (3) The training of the executive powers. The experimental work performed by the pupils themselves involves the cultivation of manual dexterity, initiative, and self-reliance.
- (4) The imparting of some of the more important principles and facts of physical science.

It will be seen that if these ends are to be attained teaching must

Method of Instruction must be practical. be practical, and as much importance must be attached to the method by which the instruction is conferred as upon the results obtained. If we are to train the faculty of

observation the teacher must do less and the pupil must do more. The little, however, the teacher does must be intensely purposeful and to the point. It is, however, the pupil's eyes and ears and judgment that have to be trained, and we shall never train them if we supersede them; nor shall we train them if we tell the student that which he might be expected to find out for himself. One principle I would lay down, which I believe is of great importance in this connection. It is, that instruction is, generally speaking, of little value unless the mind is ready to receive it, and you will probably grant me that if our pupils remember one-tenth of what they are told, brilliant results will be accomplished. The fact is, and perhaps we may be thankful for it, that the human mind, especially when young, readily rejects useless knowledge. Unfortunately, it also rejects much useful knowledge, and this is largely because it is presented in an undigestible state. In approaching the treatment of the scientific problem with pupils, the first,

and perhaps the greatest difficulty, is to get them to realise the nature of a problem. Once this is done the rest becomes comparatively easy. Once get the student's mind into the interrogative mood and the solution of the problem becomes easy.

I do not think too great importance can be attached to the training of the faculty of observation. We have abundant Training of the evidence that the sense organs are capable of Reasoning powers. being educated to a very high degree. Early lessons in Science should, therefore, be directed to this end, and in this connection the drawing lesson is no less important than the Science lesson. The second great function of the teaching of Science is the training of the reasoning powers. It has frequently been used as an argument against the teaching of Science, and conversely as a plea for what may be called "memory" subjects, that while a child has great power of remembering things, he has little power of reasoning. these statements I believe to be true; the latter I believe to be false. Children in general possess extraordinary power of reasoning: that they so frequently arrive at wrong conclusions is due to the use of Now it is argued that in training these reasoning imperfect data. powers we should make use of what is called the "scientific method." It is not suggested that the scientific method is confined to subjects of scientific inquiry. The methods employed, consciously or unconsciously by a scientific investigator, are not different from those used in any other walk of life-in say our social relationships-and the process by which we arrive at an opinion in regard to a person's character and capabilities; but the great advantage of dealing with what are called natural phenomena is that the facts are far less involved, and offer a far less complicated problem with which to deal. It is not contended that the inductive method might not with advantage be employed with other subjects of the curriculum. Many teachers have for long so employed it. Geography taught by this method is most effective and then becomes a scientific subject, not the hopeless collection of place-names which too often masquerades as geography. History, if properly taught, trains the pupil to draw conclusions from a series of carefully collected facts.

Before passing to the consideration of Science as taught in Secondary and Technical schools, I should like briefly to science in Primary schools.

Schools. Schools, particularly as for several years of my life I was closely connected with such teaching,

and for the far weightier reason that probably not five per cent of those

attending Primary schools ever pass into Secondary schools at all. I venture to express the view that the general principles I have been dealing with are as applicable in the domain of Primary education as in that of Secondary, and that Science in the form of Object Lessons for the smaller standards and more systematic and practical work for the upper standards should be introduced into every Primary school. shall, I know, be told that for many years past Science has formed part of the curriculum of many Primary schools. I am aware of the circumstance, although here I can speak with a greater knowledge of English schools than of Irish schools. In regard to the former I know that it was customary in many schools to teach such subjects as Agriculture, Magnetism and Electricity, and other branches of Science; but I am glad to say that such teaching has been discredited, and for this reason. It is impossible to give sound instruction in any specialised branch of Science such as those mentioned unless certain fundamental principles common to all sciences have been mastered. I think that the syllabus now in use in a large number of National schools of Ireland forms an admirable basis for instruction I refer to as essential. What we want, as it seems to me, is an extension of this work, and I would like to see this combined with nature teaching on similar lines in rural districts.

I come now to Science as taught in the Secondary schools of
Ireland, and this is a matter which closely
Science in Irish
Secondary Schools.

great majority of whom are engaged in
teaching the subjects of the Department's

programme in Intermediate schools. Five years ago scarcely any Secondary school in Ireland possessed a room devoted to practical science teaching. To-day I can scarcely mention a school that has not a laboratory devoted to such work. For the last six years a large number of the Secondary school teachers of Ireland have devoted a large part of their summer vacation for the purpose of supplementing their knowledge by obtaining practical experience in the Department's programme for Secondary schools. The result is that Science is being taught in all these schools on a rational basis, but it will be necessary for many years to come to maintain our strenuous efforts to secure for such teaching its due position in a general education. No attitude could be so damaging to the teaching of Science as to regard it as in any sense an extra or optional subject. There is little danger of Science attaining undue prominence in Irish Secondary schools. It is not likely in any

degree to adversely affect humanistic studies. On the other hand, if properly taught there is hardly a subject of the Secondary school curriculum that will not be benefited by the same work. I regard, for example, the first year's syllabus as well calculated to assist the teaching of elementary mathematics. The teaching may, and should, be co-ordinated with the teaching of geography. In proper hands it may also make a contribution to classical teaching.

Again and again we have ventured to insist upon what we regard as an important principle in this work, namely, that the method of teaching is of far greater importance than the mere imparting of knowledge; that, at all events, so far as the first two years' course is concerned the main object of the course is to teach the pupil to observe and to reason upon what he observes. Indeed, the whole course is directed towards developing what we have spoken of as the scientific method of Science. As to the method of teaching, there is no new or strange doctrine. We only ask that instead of teaching the facts of Science by the high and dry didactic method you shall regard the pupil as a thinking being; you shall refrain from telling him that which he should have opportunity for finding out for himself in the laboratory; and that you shall shape your teaching as far as possible on the inductive method, since it is this method which has consciously or unconsciously led to scientific discovery and progress. In discussing this question with teachers, I have been told that this method is the one adopted by Socrates, and so it is, with one all-important difference. put his questions to the human mind: Francis Bacon taught us that we must put our questions to nature. A good example of the Socratic method may be seen in the cross-examination related in the Memorabilia of Xenophon, where Socrates asks a young man, Glauco, who aspired to rule the state, a number of questions as to his fitness for this task. The conclusion of Socrates after many searching questions is worthy of being committed to memory. says: "If, therefore, you desire to be admired and esteemed by your country beyond all others you must exceed all others in the knowledge of those things which you are ambitious of undertaking, and thus qualified I shall not scruple to insure your success whenever you may think proper to preside over the Commonwealth." The Socratic method was well calculated to turn out an excellent controversialist, but it was rather barren of results in the domain of scientific discovery. As a matter of fact, Socrates, while in early life greatly interested in inquiries concerning natural phenomena, became fatigued when studying objects through the perception of the senses only, and looked for the ideals or reflections of them in the mind and turned, as he tells us, his attention to "words and discourses." His attitude, indeed, was the very antithesis of the spirit of the "Novum Organum." With Bacon a new spirit was awakened. He warns us that progress can only be made through the medium of a sound induction based upon properly assorted facts. The conclusions at which he arrives, though half concealed under quaint imagery, have been of untold value.

There is no necessity to make a fetish of the inductive method, but it is surely wise that in teaching the Students should be fundamental principles of Science we should seek to place our students as far as may be Investigators. in the attitude of investigators. Let the student observe for himself such facts as bear upon the principle we wish him to learn, and reason upon what he has observed. notice here two great collateral advantages. We are training the powers of observation of the student, and in leaving him to perform the experiment for himself we are training his executive powers. When a principle has been established in this way, I think we should fully discuss it in all its-bearings with our pupils, and seek more than at present to utilise these principles to illustrate matters of every-day life. Again and again does one find the pupil regarding the great principles learned in the laboratory as something peculiar to it and remote from everyday existence.

I must now refer briefly to the teaching of Science in Evening schools. I have laid great stress upon the value of Science in Primary and Secondary education as a means of mental training.

We cannot hope, under present conditions,

to cause Science teaching to wholly fulfil such a mission in Evening schools, and yet I regard the Evening Technical school of supreme importance. I would greatly prefer a Day Technical school if we could have it, and I am glad to believe that great development is possible in this direction; but the Evening Technical school will long have a most important duty to perform in relation to industry. The students of our Evening Technical Schools are intensely in earnest, their attendance is voluntary, and the majority of them are engaged in employment where they learned how much they need to know. But these very circumstances dictate a different treatment of the students. They come to learn something which should bear as closely as possible on their daily work, and

for the most part they are impatient of scientific principles which do not appear to bear directly on their business. It is true that many students ambitious to attain the higher branches of their calling find it necessary to stop and go back to make good some fundamental defect in their education. Our students often find that they are not in a position to study a specific branch in Science because of their defective knowledge of mathematics. Notwithstanding, there are large numbers from the ranks of labour for whom we should be prepared to afford a training which might be rejected as unsuitable for producing captains of industry but yet would lead to greatly increased efficiency in the ranks. ing industrial conditions dictate that technical education must not seriously delay the entrance of boys into working life. We are not much helped by references to Germany while conditions are entirely different, but must seek to work out our own special problems, utilising such light as may be shed upon them by the practice in other countries. We may hope for a great development of apprenticeship schools, for we must remember that the workshop is after all a trade technical school, and that the workshop has been organised to train workers as well as to use them. We may be able to utilise our central Technical schools for the teaching of principles only. Until then they have widely varied and most important functions to fulfil. "A self-governing nation," as Professor Sadler says in his report on Secondary Education in Liverpool, "needs good Evening schools, because they provide what is really a form of Secondary education for the masses of the people," and he adds, that "so far as Evening classes in technical subjects are concerned, there are many signs that the more enlightened employers of labour are taking a much keener interest than heretofore in the question of the education of their apprentices." There are signs of a growing interest in Ireland also, where, in some cases-still too few-employers have sought to join hands with educators in regard to the education of the young worker. Better still is the increasing interest and favourable attitude of the trades organisations themselves. They have realised the importance of technical education and may be relied upon to co-operate in its advancement.

GEORGE FLETCHER.

### IRISH BACON.

The Department have recently carried out an inspection of all the important bacon factories in Ireland, and have also made inquiries as to the trade in Irish bacon amongst wholesale bacon factors in London and the North of England.

For the production of bacon of the highest quality it is necessary. (1) to breed suitable pigs, (2) to feed the pigs properly, (3) to ensure that only healthy animals are used, and (4) to cure the pork under the best sanitary and other conditions.

Breeding of suitable

Pigs.

Instruction for Ireland the Bacon Curers' Association in the South of Ireland took steps to encourage farmers to produce an improved type of pig by supplying them with well-bred boars. For five years the Department have placed at the disposal of County Committees funds for the improvement of swine. As a result of these endeavours on the part of the Bacon Curers' Association and of the Department, the Irish pig has greatly improved in quality and in suitability for the making of bacon.

One of the most important factors in producing pigs for bacon is proper feeding, and in respect to this matter Proper Feeding of Ireland is in a singularly good position, for it possesses in quantity excellent foods for pig feeding, i.e., separated milk, buttermilk, and potatoes. These, when supplemented by home-grown or purchased cereals, make first-class rations for the production of the best quality of pork, and the Irish farmer having, as has been already shown, a supply of well-bred pigs is able to market them in excellent condition.

Further, inspection of pigs is carried out by the Veterinary Inspectors of the Department, and in the fairs and markets by Inspectors under the local authorities. No pains are spared to ensure that none but healthy pigs reach the curers' establishments.

As regards the curing of the pigs, this is a long-established industry in Ireland, and Irish bacon has deservedly obtained a world-wide reputation. The recent inspection of the bacon factories in Ireland shows that great attention has been given to the carrying out of the curing under sanitary conditions, and several of the curing establishments are models, both as to construction and management.

Careful inquiries have, however, been made outside of Ireland among representative merchants as to their opinion High Estimation of regarding Irish bacon. As a result of these Irish-cured Bacon. inquiries the Department are in a position to refute the statements recently made to the detriment of Irish bacon. That the British public are content to pay more for the well-known brands of Irish produce than for the bacon imported from any other country is abundant proof, if that is required, of the high estimation in which they are held. Irish bacon and hams are renowned for their mild cure combined with good-keeping quality, excellent flavour, uniform quality of each particular brand, and comparative freedom from "mis-cures." This reputation extends to the Continent, Irish hams being especially prized in Paris and Brussels. There is no foundation whatever for the statement that, as compared with previous years, a greater proportion of second-class bacon is now exported from Ireland; and equally untrue is the report that the best Irish pigs are bought by English bacon-curers for export to their establishments in England On the contrary, the evidence of bacon merchants abundantly proves that the reputation of Irish hams and bacon never stood higher than it does at the present time.

# THE PREVENTION OF TUBERCULOSIS IN CATTLE.

The possibility of preventing tuberculosis depends upon the fact that it is an infectious disease, and, being infectious, Tuberculosis an the steps to be taken are parallel to those taken Infectious Disease. for the prevention of any other infectious disease, viz., isolation of the infected animals and destruction of the infecting germs.

Until recently tuberculosis was believed to be a hereditary disease—a disease which the offspring of tuberculous parents could rarely escape, and which, if escaped, would re-appear sooner or later in their descendants. The escaping generation, if it did not hand down the disease, handed down the tendency to contract it, and in their descendants this tendency developed into the disease itself! Thus, for the descendants of a tuberculous ancestry there was little hope. If they escaped the disease they carried with them the tendency to contract it.

These beliefs are now known to be wrong. An animal can become tuberculous only by infection with the germs of the disease. And not only so: there is no evidence that the offspring of tuberculous ancestors are more liable to the disease than the offspring of those that are sound. Experiments have shown that, by removing them from infection, individuals with a tuberculous ancestry may grow up sound and remain sound, whereas others with a sound ancestry, by being brought in contact with the disease, may become unsound.

To know how to prevent tuberculosis we must know how an animal becomes infected, and how it infects others.

How the Disease There are two main pathways by which the is Spread. germs of the disease enter the body—the nose and the mouth, with the breath or with the food and drink. The germs are living things, and, being alive, they must be fed. Their natural food is the living tissues of a living animal. Once in contact with living tissues the germs endeavour to feed upon

Once in contact with living tissues the germs endeavour to feed upon them, and, if they succeed, the animal whose tissues are attacked has contracted the disease. The germs multiply quickly at the points they have attacked, and at these places there arises an accumulation of the germs themselves and of the tissues destroyed. From these accumulations germs pass on to neighbouring tissues, or are carried sometimes to

distant parts of the body. Thus the centres first attacked lead on to others, these to others still, and so on till in time the majority of the animal's glands and organs may be diseased.

The progress of the disease depends upon the resistance the animal is able to offer to it. This resistance depends upon the animal's inherited strength, and upon fresh air, food, shelter and healthy exercise. In the earlier stages of tuberculosis a vigorous, well-nurtured animal may recover; in the later stages its chances are slender indeed. Thus the disease is usually less extensive in young than in old animals. It is also much less common among young than among older animals. The following is an estimate of the number of cattle affected at different ages in the United Kingdom:—Yearlings, 5 to 10 per cent.; two-year-olds, 10 to 20 per cent.; cows, 40 to 60 per cent.

It is unfortunate that, in its earlier stages, tuberculosis is not readily detected. An animal may have had the disease for years before being found out, and for some time it may have been spreading the infection. The earlier recognisable symptoms are that the animal ceases to thrive; its coat becomes dry and staring, and loses its oily feeling; the hide is less soft and pliable, and adheres more closely to the body; the eyes look sunken and dull. Later, these symptoms are accentuated, the belly becomes tucked up, and very often the animal has a hard, painful cough, and is unable to endure cold. Other symptoms are swellings about the throat, continued looseness of the bowels, and rises in temperature. Among cows a frequent sign is that they abort, become uncertain, or cease altogether to breed.

It is when the disease is in the lungs or in the udder that an animal is most dangerous to others. When the lungs begin to break down the germs of the disease are scattered with every cough. If the diseased animal is in the house, then the walls, the floor, the feeding-trough, and other parts near become spattered with infective materials. They are similarly spattered when the throat swelling bursts. These infective materials dry up and a germ-laden dust is raised and tossed about with the very slightest breath of air. Every other animal then living in the same house runs risk of contracting the disease. If there are more animals than one spreading the disease, then the risks to the others ar increased. In a byre that has been tuberculous for years, the accumulated risk may become enormous.

In the case of tubercular udder, the risks are to those that drink the milk. A calf reared by its dam takes the whole risk. Calves among whom the milk from a tubercular udder is divided, divide the risks

among them. How many they are that take these risks may be calculated from the basis of one cow in every thirty or forty having a tubercular udder.

The udder of every cow should be examined, and if any cow's udder is tubercular her milk should be used no longer. Such milk is dangerous. A tubercular udder is detected first by feeling one or more hard little knots in the soft and flexible interior. As the disease proceeds these knots become larger and larger. The smallest knot is a sufficient warning.

From the foregoing the steps that should be taken to prevent the disease are apparent.

They are separation of the sound from the unsound and thorough disinfection of infected premises.

Animals which from their outward be Prevented.

appearance exhibit symptoms of tuberculosis should be cleared out at once. They are a certain source of infection to the rest of the herd; and they cannot be fattened or expected to breed. By the use of tuberculin it is possible to divide the remainder of the apparently healthy herd into those that are sound and those that are unsound. The former, as well as all young animals from which it is intended to breed, should as far as practicable be kept apart in order to obviate the danger of infection.

While those who take up seriously the question of ridding their herds of tuberculosis will find in tuberculin, when used with the above object, an excellent aid to the end they have in view, the simple process of thorough disinfection as a means of eradicating this disease is not only simple and inexpensive, but, if well done, effective. It should, therefore, be undertaken by every owner of breeding stock.

The byre or cow-house must first be thoroughly cleared of all food, straw, litter, or manure. The disinfectant to be used is crude carbolic acid. Mix this in hot water in the proportion of one of acid to twenty of water. Stir until the acid is well mixed with the water; then with the hot mixture spray every part of the inside of the building until it is thoroughly saturated. The greatest attention should be given to the feeding-troughs and other parts near them which have been most breathed or coughed upon; but no part of the building—floors, walls, eaves, crevices, even the wood of the roof—should be omitted. The mixture can be sprayed with an ordinary garden syringe or with a spraying machine. The quantity required is about one gallon of the acid to every ten head of cattle, that is two gallons of the mixture to every head; but the first time a place is disinfected it would be wise to

use more. The disinfecting should be done once every year at least; preferably in summer when the cattle are on the pastures and the byres are empty. All doors and windows should be kept closed for eight or ten hours after the byre or cow-house has been sprayed. If an animal shows signs of tuberculosis during the winter and has to be removed, the part of the byre it stood in should be disinfected before another fills its place.

The man who is using the sprayer or syringe should keep his hands and arms well smeared with oil during the process.

The farmer who follows the above directions faithfully may reasonably hope to have his whole herd entirely sound in a few years; but his success will depend upon his keenness in singling out and isolating suspected animals, and in the thoroughness with which his premises are disinfected. It will also depend upon the care he exercises in introducing new animals, more especially cows, to his herd. If he is bound to buy in strange stock, he should treat them as suspects until he is assured they are sound.

If a farmer is unable to have the sound and the unsound in separate houses, then he can at least have them in separate ends of the same house, with as much space between them as possible. In such a case, however, the disinfection must be done oftener than once a year, and the unsound must be got rid of with the very shortest delay. But the same success cannot be looked for as with complete isolation.

But disinfection and isolation must never become an excuse for neglecting the remedies provided by nature, which are sunlight, fresh air, and exercise. With regard to light and air, the byre should be as like as possible to the open field, and every animal should have frequent exercise.

Copies of this article in leaflet form (No. 69) may be obtained free of charge, and post free, on application to the Secretary, Department of Agriculture and Technical Instruction for Ireland, Upper Merrionstreet, Dublin. Letters of application so addressed need not be stamped.

# THE MARKETING OF IRISH PRODUCE.

#### I.-EGGS.

Since the beginning of the year inquiries have been made into the state of the Irish egg trade in the British markets, and in the pursuance of these inquiries a number of those engaged in the distribution work of the trade have been interviewed with the object of eliciting the fullest expression of their views on the matter.

Five of those called on said that no further improvement in handling Irish eggs by shippers was possible. Twenty-six said they had noticed a distinct improvement in recent years in handling and packing, while sixteen showed the Inspector cases of Irish eggs they had received which were all that could be desired as regards the eggs, cleanliness, grading, packing, and package used.

Where this good packing was seen the Irish egg was more than holding its own; some of the comments made by buyers were distinctly encouraging.

- "Getting from good shippers only; buy nothing but Irish."
- "Buying more and more Irish; quality so much improved."
- "Can't get enough Irish eggs (well packed) for demand, which is becoming greater year by year."

The competition in the egg trade is increasing. Supplies now come from Russia, Denmark, Germany, Austria, Hungary, Belgium, France, Canada, Egypt, U.S. America, Sweden, Italy, Spain, and Morocco—in several places there were seen very good eggs, well packed, sent from Wales, Cornwall and the North of Scotland, while the essentially English new-laid egg trade was found to be steadily growing.

Requirements of the Buyers must be attended to.

Requirements of the Buyers must be absolutely relied on—where contrary con-

ditions prevail, or are believed to prevail, these same firms are chary of doing business, and as one very large trader put it: "All

the Irish we handle comes to us on consignment." Now no Irish shipper who packs reliable, clean eggs in packages as demanded by the purchaser, graded and true to grade, need ever sell on consignment; sending on consignment is to a large extent a sign of weakness and does harm to the trade.

Several of the largest buyers in Great Britain, not being able to get their requirements met by shippers, have been compelled to come over to Ireland and pack eggs in a satisfactory manner to fill their orders. Unless a large number of the Irish shippers alter their methods this departure is likely to be greatly extended.

ber of people in several of the large cities or Frauds on Shippers. towns at the commencement of each season circularise shippers in Ireland, give glowing accounts of the prospects, promise good prices, and a ready sale; a few shippers have been caught by these specious promises, and have sent eggs on consignment. Sometimes first consignments are paid for in the hope of larger consignments being sent; more often than not the first lot is not paid for and the eggs are sold below current market prices. If shippers will bear in mind that there is always a market at a fair price for well-packed, reliable eggs, and cease consigning eggs to unknown firms, not only will a practice entailing loss to themselves be stopped, but one of some great drawbacks to the healthy development of the egg trade be removed.

In considering the question of how to further improve the Irish egg trade, it may be stated—(1) that as to The Market Conditions size and quality the Irish eggs are conto be observed. sidered satisfactory; (2) that there is a strong demand for Irish eggs in Great Britain; that there is a distinct desire on the part of the public, and therefore of the retailers and wholesale firms to buy them; but (3) that many of the merchants complain that modern market conditions are not considered, and that suggestions made by them are not carried out. The following are the conditions and requirements demanded:—Better cases, cleaner and better packing, cleaner eggs, truer grading, less "holding back," and less breakages.

Many of the cases seen by the Inspector were too small for the
eggs they contained, and the eggs were
Better Cases too tightly packed; others were made of
wood too light in substance; others, again,
were made of unseasoned wood, which gives off a dampness

affecting packing and eggs. The bulk of the buyers asked that cases should be made of white, dry, clean-looking foreign wood, but if dry native wood were used it is believed that little . objection would be raised. As to the sizes of cases, three very old buyers preferred large cases holding forty great hundreds or more. One case holding sixty-four great hundreds, and weighing 11½ cwt., was seen being unloaded with considerable difficulty in a northern town. Of the large number of buyers that were interviewed a few said they preferred more than one size case; fortyseven desired the long division, twelve great hundred case, so that the case might be sawn through to make two six great hundred flat cases; three preferred the same size and shape with three divisions, to make four three great hundred flat cases; thirty-two preferred the six-layer deep six great hundred case; forty-six preferred the four-layer flat six great hundred case; thirty-one preferred the four-layer flat three great hundred case. Taking these figures as representative, it must be assumed that the standardising of egg cases to any one model is not advisable at this juncture. Shippers are recommended to find out the requirements of their customers and pack the eggs accordingly. The tendency appears to be towards a long twelve great hundred one division, a flat six great hundred, and a flat three great hundred case.

Seventy-six of the buyers said they required the packing material to be straw, clean and dry; thirteen Packing Material. asked for wood wool; five would take consignments packed in either straw or wood wool; four required both used; and forty-five expressed no opinion.

Great stress was laid on the importance of having the straw used for packing perfectly clean and dry. Buyers complained of eggs being packed with damp straw, and some attributed this to the packing being done in the open and in the rain. Various objections to wood wool were raised, two of the most cogent being—(1) that cheap wood wool was often used: that this was frequently resinous, and when it got damp from rain or breakage the eggs took up the malodorous flavour and retained it; (2) "Wood wool wasn't Irish, and was too much like the continental style of packing." It is significant that straw is used with nearly all the eggs packed by English firms in Ireland.

Many of the buyers complained of eggs being slightly "chipped." This was ascribed to the custom of placing them in heaps before packing.

Dirty eggs are the greatest defect in the trade. One old shipper, himself an Irishman, put this concisely Cleaner Eggs. when he said, "The chief thing to do to improve the trade is, send only clean eggs."

One erstwhile buyer of Irish eggs explained the necessity for this change being made by saying, "I have a clean shop, and can't show dirty eggs." Sixty-two buyers said they would not have dirty eggs at any price; five asked that they (dirty eggs) might be packed in separate cases if sent; nine suggested that the eggs should be washed, packed separately, and that the cases should be specially marked and advised; while only one said he would buy dirty eggs.

The question of cleanliness is becoming of increasing importance. Foreign eggs are now sent practically universally clean, dirty eggs, if sent, are packed separately; and if better prices, greater consideration, and a larger opening for Irish eggs is desired, this matter must be dealt with thoroughly.

Eighty-five buyers asked to have truer grading attended to; while only eight did not require them

Truer Grading. graded; twenty-eight said they wanted the eggs packed in rows, when if any small eggs were put in they would be immediately detected. This appears to be a suggestion of value. Foreign eggs are nearly all graded, and every effort is made to keep them true to grades; Irish eggs must follow suit in order to successfully compete.

It appears that producers and shippers of eggs in all countries are more or less guilty of the practice of "Holding Back." "holding back" on a rising market. is in all probability no one cause more destructive of confidence and satisfactory relations between buyer and seller. The small immediate profit which is gained is much more than swallowed up by the loss in profitable future business. At the moment there appears to be no entirely adequate method of dealing with this practice. An example might be made of a shipper sending very stale eggs by having the eggs seized as unfit for food by the sanitary inspector of the town where they are exposed for sale. Often enough, however, it is the producer, not the shipper, who is to blame, and if an appeal to his honour, sense of fair play, his reason, and his duty to the buyer and the trade is of no avail, nothing further can be done. Stamping of Irish eggs is not approved of by any of those of whom inquiry was made, and it is believed that in those countries where stamping is carried on it is not so extensively done as heretofore.

Fifty-one buyers complained of excessive breakages in Irish egg cases: seventeen attributed this to bad handling; fifteen to bad packing. Next to Breakages. cleanliness, improvement in this matter is most to be worked for. All eggs imported into Great Britain have to travel partly by water; therefore the matter of handling is similar in all cases of importation. Buyers state, however, that there are more breakages in Irish cases than in any other. this to "storing eggs in heaps before packing," "hasty packing with trays," "insufficient straw round the sides of the cases," "thin wood of cases," "hurried handling by railway and steamship companies," and "carelessness of all concerned." A number of the buyers declared that since they had purchased only twelve great hundred long cases their breakages have very much diminished; others have achieved the same result by having everything carried at company's risk. Whatever the cause of breakages, it behoves all concerned to do their part in remedying a very unsatisfactory state of things--the shipper, by paying more attention to the packing, and to the kind and quality of case used, and those handling, by not "up-ending" cases and always remembering that eggs require very careful treatment.

The demand for Irish pickled eggs is increasing. Nineteen traders stated that they were buying them,

Pickled and Cold the quality being satisfactory; eleven wanted to try them. It appears, however, that the demand is greater than the supply.

"Lime" pickled was preferred to "glycerine." Cold-stored eggs

were not approved by either those who had experimented with them or those who had bought them.

In addition to the points above enumerated it appears that if
Irish eggs, in many places where the conNew Laid Eggs. ditions are favourable, were collected daily
as laid and despatched promptly to be sold
as "new laid," much better prices might be obtained. This phase
of the egg trade is worthy of consideration by progressive and upto-date producers and shippers; a few are already supplying newlaid eggs. Ireland and France are geographically in a better
position to supply the British new-laid egg demand than any other

country. France has already gone a long way towards meeting this demand. Ireland should realise the possibilities and take the necessary steps to obtain a much better price for a proportion, at any rate, of her egg production.

## Advice to Egg Producers.

The nests should be regularly supplied with clean, dry hay or straw. The result will be cleaner eggs for market.

Eggs should not be "held back" on a rising market, nor at any other time. Eggs "held back" cannot retain their freshness, and the sale of such eggs does harm to the trade.

The eggs should be packed carefully in a box or case when sending to market, clean, dry straw or wood wool being placed between. Chips which are not noticed when packing become breakages afterwards.

As brown eggs sell best, every effort should be made to produce them.

## Advice to Egg Shippers.

Only clean eggs should be bought; or less money should be paid for dirty eggs. The latter should be packed separately.

Eggs should not be stored in heaps before packing; they should be packed as bought.

The cases should be bought only from a reliable maker; cheapness is not everything.

Dry seasoned wood, of the right thickness, and cases of the right size, should be insisted on.

The eggs should only be packed in cases of the sizes demanded by the buyers.

Clean, dry straw or non-resinous wood wool, in accordance with the customers' requirements, should only be used.

In case of rain the packing of eggs should be done under cover. When using packing trays the work should not be done too

When using packing trays the work should not be done too hurriedly.

All eggs for sale should be graded throughout, and kept true to the grades; and the customer should be supplied with the grade or grades he asks for.

Suppliers should be watched to see if they "hold back" on a rising market; if it is found that they do so "hold back," buying from them should cease.

Shippers should not "hold back" any eggs at any time. Indulging in such a practice will cause the loss of customers, and the better the customer the more certainly will he be lost. Eggs should not be sent "on consignment."

Unknown firms should not be supplied without full inquiry beforehand.

Eggs, unpacked or packed, should always be handled with care. Every precaution should be taken to see that railway companies do not "up-end" the cases or handle them carelessly.

#### 2.—CRAMMED POULTRY.

London is generally believed to be, practically, the only market in the United Kingdom for the sale of crammed chickens. Crammers usually send Best Market for Birds of 5 lbs. weight their consignments to salesmen in Leadenand upwards. hall and Central Markets, and their experience has shown that for the very best and finest quality birds of 5 lbs. weight and upwards, London is undoubtedly the most profitable outlet. The "returns" in some instances, however, have displayed great disparities in prices in the same consignment, and this is alleged to be due to difference in size and variation in quality. Where the latter is the case, the remedy lies with the sender, who should exercise more care in selecting his birds for fattening and in grading them for sale purposes. In the former case it is possible that for sizes under 5 lb., as good or better markets exist in the provinces.

The market in London is apparently never overstocked with crammed birds of best quality 5 lb. each and over. Smaller birds and birds of inferior quality are often a drug on the market, and are cleared at a price that can leave no margin of profit to the crammer.

These smaller-sized birds, if of good quality, might be sold at paying prices in English and Scotch cities

Possible Markets for which are nearer to Ireland than London, smaller Birds. and in which the market for high-class chickens 3 to 5 lbs. in weight each is rarely

over-supplied.

The demand for high-class poultry in Great Britain has increased largely in recent years, and is still increasing. This demand is partly supplied by Ireland, Russia, and the United States of America. The Russian supplies compete more particularly with the

Irish uncrammed chicken; the American supplies, sold largely as "milk-fed," fill the demand for which it is suggested the smaller crammed Irish chicken should compete.

Crammers in Ireland are generally conversant with the market conditions in London, as to packages, pack-

Conditions for ing and handling; but very careful inquiries

Developing the Trade. have been made as to the conditions to be
observed in developing a trade in the provinces of Great Britain, and the following suggestions are tentatively put forward:—

The Birds.—Black feathered varieties, providing they are of good quality, are not objected to, size 3 to 5 lbs. Indian game, or crosses with that breed, are preferred in South Wales and the West of England, size  $3\frac{1}{2}$  to  $4\frac{1}{2}$  lbs.

Preparation.—The birds should be killed by dislocating the neck—if intended for cold storage birds should be bled. The birds should be plucked clean (and carefully, to avoid "tearing") except at the neck and head; in those intended for the West of England markets, however, the wing feathers should also be left on. They should not be gutted, or only partly in hot weather. Birds may be packed "shaped," i.e., as for London, except for the West and North of England, where they should be sent straightened only. In no case should the breast bone be broken.

Package.—This should be a wooden non-returnable case to hold one dozen in one layer, the top to be nailed, not tied, and with holes all round, for ventilation.

Grading.—This is a most important matter, and the cases should be in sizes for birds 3 to  $3\frac{1}{2}$  lbs.,  $3\frac{1}{2}$  to 4 lbs., 4 to  $4\frac{1}{2}$  lbs.,  $4\frac{1}{2}$  to 5 lbs. in weight; moreover, not more than  $\frac{1}{2}$  lb. should separate the largest from the smallest bird in each case. This, if the birds are of even quality, will ensure uniformity of price in each case or enable the birds to be sold by weight, which is fairer to all parties concerned.

Packing.—Clean white paper should be placed on the bottom of the case inside before commencing to fill, the birds being then laid in and out, viz., head and tail, tail and head—another piece of paper folded should be placed over each head and neck and under each body, a further piece each side of the case, with a clean wellfitting piece over all. Branding.—All cases should be branded with the initials only of the sender and the grade, thus, "T. K. 1 doz.  $3\frac{1}{4}$ .4 lbs."

N.B.—It is necessary to "cool" the bird before packing in the case by keeping in a very cold room for some hours. In very hot weather it is advisable to put the birds in a "cooler" or refrigerator to lower the temperature of the bird to 32 F. before packing; if intended for cold storage this is essential.

It may be necessary to send one or two lots on consignment when commencing business with any trader, to enable him to judge of the quality; if this proves satisfactory and the shipper is found to be reliable, and "presenting" his produce fairly, there would appear to be no difficulty in securing regular orders at market prices.

In order to test the value of the foregoing recommendations trial shipments to different centres in England have been made by various crammers in Ireland. It appears that where the conditions have been met and the supplies continued of high quality, a healthy demand has been created which is capable of considerable development.

It must not be assumed that chickens can always be bought at current rates in Ireland, crammed and sold

Trade not always
Profitable.

In certain months of the year, on the contrary, the work must result in loss, and during a big game season this loss.

may be very considerable. From a profit and loss standpoint the period from middle of September to middle of December is the most difficult time of year for the crammer; it is not easy to stop the work during these months and take it up again when prospects improve, neither is it possible to have at all times certain orders awaiting the time when chickens are ready for killing. The ideal condition would be for the orders to be in hand and the birds then to be bought at a price that would leave a margin after cramming and other expenses were added. This idea may be worked for, though it is not easy of attainment.

To meet these difficulties, other countries have resorted to the cold storage of poultry. Inquiries have been made on this matter, and there seems to be no doubt that America and Russia largely use this aid in the conduct of their poultry work; that when birds cannot be sold at remunerative prices they are cold-stored till prices rise;

that prices do rise, and birds so stored are then sold as cold-stored chickens, realising a profit on the original cost, the expenses of storage and interest of money.; that a system of "warrants" are issued against cold-stored produce, upon which advances are made to holders of good standing by their bankers; that, further, Irish birds have been cold-stored when prices have been low (in 1905) and sold (in 1906) when prices have risen; that the quality has been approved by the buyers, and that with much better prices realised a certain loss if the birds had been sold when killed, has been turned into a profit.

Bearing on this question, however, the following extract from "Cold Storage and Ice Review," April 15th, 1906, is important:—

## "Anti-Cold Storage Legislation."

"Cold storage warehousemen of New York City and also in Chicago, are very much exercised over a Bill in the New York Legislature known as the Fish Bill, forbidding the storage of poultry that has not been drawn within forty-eight hours after slaughter. The Chicago cold storage men are further concerned about the introduction of an ordinance by the City Council to license cold storage warehouses, the licence being placed at 500 dollars a year, and to compel the labelling of all perishable goods placed in storage, with date of their receipt. It is proposed that the label must remain a portion of the original package, when the goods come into the retailers' hands until actually disposed of. The ordinance also absolutely prohibits the storage of undrawn poultry, fish, or game. Both these proposed laws, it is thought, will work a serious hardship upon the trade. In New York, it is claimed, it will practically destroy the poultry business, three-fourths of which is in frozen poultry, and estimated to be worth at least 20,000,000 dollars a year. In Chicago the law is objected to because of the great opportunity it gives for inspectors to blackmail cold storage people, or compel them to pay sums according to the greed of the inspector, on the threat of adverse reports, and the fish, poultry, and fowl sections of the Bill are objected to for the same reason as in New York, because the drawing before storage is said to be impracticable, and the claim is made that if stored in a drawn condition the poultry would be subject to so much more rapid deterioration and decay as to render its use dangerous."

#### 3.—FRUIT.

The production of all kinds of cultivated fruit in Ireland is on the increase; the consumption of it in the fresh state is growing, if anything, at a faster rate, while the demands of the jam, bottling, canning, and cider making industries take, year by year, more and more local grown produce. Hence the marketing of Irish cultivated fruit will probably be mainly done in Ireland for some time to come. Many growers have adopted the standard packages described in the Department's leaslet No. 57, for marketing fresh fruit, with, it is believed, satisfactory results. More attention has also been given to improving the picking, packing, and handling of fruits intended for preserving by the growers; a memorandum to fruit growers, issued last year by the Department, has resulted in cleaner and better deliveries being made.

BLACKBERRIES, BILBERRIES, AND CRAB APPLES.

Attention has been given especially to the outlet in Great Britain for wild fruits:—blackberries, bilberries, and crab apples. A number of salesmen, buyers and preserve manufacturers in many centres in Great Britain have been interviewed this year, in order to ascertain present sources of supply, packages and packing used, and the possibilities for outlet of Irish produce.

Great Britain imports blackberries chiefly from Ireland. recent years increasing quantities have come in from France, principally St. Malo, while Blackberries. there is now more attention being paid to the gathering of this fruit in various parts of England. Buyers, jam manufacturers particularly, prefer the Irish blackberry to any cther, but complain of want of attention on the part of the shippers to market requirements. In 1905 some Irish blackberries were still being sent in very large casks holding 10 cwt., the bulk were shipped in casks holding about 4 cwt., while latterly smaller packages, kegs holding 1 cwt. each, have been tried. The general consensus of opinion is that casks holding 10 cwt. should never be used, and that even those holding 4 cwt. are much too large. 1 cwt. kegs, while a distinct improvement on the former packages, are not so satisfactory as bell-shaped tubs holding 28 lb. or 42 lb. Some large buyers are now offering to supply these bell-shaped tubs to responsible shippers to be returned full; they are made of oak, shaved clean inside, and have no head, the top hoop being loose, allowing it to be placed and driven over a piece of clean canvas, covering the top, when the tub is filled. These tubs cost 1s. 9d. to 2s. 3d. for the 28 lb. tub, and 2s. 3d. to 3s. 6d. for the 42 lb., according to thickness of wood, style, and finish. Fruit sent away in large casks ferments in transit, arrives in bad condition, and its value for preserving is lessened. It is certain that if the Irish trade in blackberries is to be maintained, to say nothing of being increased, tubs of the above-mentioned sizes, or, where the transit is shorter, half-sieve baskets must be adopted. The latter are not generally recommended, as buyers believe that for long distances and water transit the tub is preferable. The value of the fruit exported in the packages recommended is very much greater than that of the fruit exported in the packages mainly in use at present.

A number of Preservers complained of "added water." This is an exceedingly foolish practice, and does much harm to the trade.

French blackberries come in tubs, half-sieves, and baskets; English fruit in the same or similar packages. The chiphandle baskets have been tried in Ireland during the last few seasons; they are non-returnable, light, made in two sizes of (guaranteed) tasteless and odourless wood with a metal handle, holding 5 and 10 lb. approximately and measuring 1 and 2 gallon respectively. They are used for picking as well as carrying; a cardboard cover bearing address of consignee is used. For convenience of handling in transit, four are tied on a stick. They are supplied in  $2\frac{1}{2}$  gross crates. The price varies according to the season of the year when they are bought, but is about  $1\frac{1}{2}d$ , for the one-gallon, and 2d. for the two-gallon size, an extra charge being made for covers.

Blackberries sent in tubs go by goods, and in baskets by passenger train. The former are sold for jam, the latter for immediate use, fresh. As an illustration of the advantage and importance of forwarding fruit by passenger train the following case may be cited. A consignment of the fruit, in baskets, was sent from a long distance in Ireland by goods train to a British market. It took  $2\frac{1}{2}$  days to reach its destination, realising £7 per ton. A second lot took  $1\frac{1}{2}$  days by goods train, and realised £12 per ton. Other lots were sent by passenger train and, taking only twelve to eighteen hours in transit, realised up to  $2\frac{1}{2}d$ . per lb., or £23

per ton. The principal markets for "baskets" are Lancashire, West Riding of Yorkshire, and the Northern Midlands. For clean, well-picked, dry, ripe fruit the market is practically unlimited.

Blackberries require to be black but not soft when picked. It will not do to gather them when they are dark red or red black, as they will not ripen with keeping. If too soft they become musty in transit. Picking should be done on dry days only.

Bilberries, otherwise known as "hurts," "fraughans," "wortleberries," "blaeberries," and "dewberries," Bilberries. are in greatly increased demand in the markets above mentioned. The packages demanded are the 5 and 10 lb. baskets. The present supply comes mainly from Germany via Hull and other eastern parts of England. The exact quantity imported last year into England is not known, but it is believed to be well over 1,000 tons. Very little is used on the east coast of England; the great bulk of it comes to Lancashire and the West Riding of Yorkshire. Large quantities of this fruit grow on the Wicklow and other mountains, and near Clonmel some is being collected each year and sent principally to Manchester. It is essential that whatever is picked should be clean, dry, free from leaves, and forwarded per passenger train service the same day as picked. Practically the fruit is always sent on consignment, and the prices realised depend entirely on its condition. Ireland appears to be exceptionally well-placed to supply this market. The Irish-grown bilberry is much liked by buyers, who only complain of leaves in some cases and bad condition on arrival. The distance to the market is much less than from North Germany, the fruit costs nothing but the time required to gather it, and it is not difficult to pick, as it grows within the reach of a child.

Bilberries should be picked when just ripe, not soft, and on dry days only.

Crab apples grow wild in many parts of Ireland. They are highly appreciated by some preserve manufacturers in Great Britain who know their value for jelly. They should be gathered before they are too ripe, be despatched in fresh emptied sugar bags, tied, not laced, and sent by goods train.

Experiments have also been made in Ireland in pulping blackberries and crab apples. The replies to Pulping. enquiries addressed to firms who had purchased some of the pulp so made showed that the results had been quite satisfactory. In certain years pulping pays; when the Preservers have a large quantity of all sorts of fruit, blackberries and crab apples are only in limited demand and at lower prices. Properly pulped and stored in tins holding 25 lb. for blackberries, and casks holding about 5 cwt. for crab apples, the fruit may be kept till a scarcer year, which generally immediately follows a bountiful one, and sold at an enhanced price. It is certain that a pulping plant which, so far as the apparatus is concerned costs about £5, or with steam boiler £25, would be a valuable adjunct to the trading materials of a shipper of wild fruits.

# SUMMARY OF CROP REPORTS, JULY, 1906.

Reports have been received by the Department from correspondents throughout the country regarding the condition of the crops at the beginning and in the middle of July. The following summary presents the chief points of interest in the Reports:—

#### Leinster.

Oat crop good, very little injury from wire worm or leather jacket. Black winter oats sown by some Co. Carlow. farmers, very good. Barley very good. Potatoes very good; damaged in places by frost; no blight; increase in area sprayed, but spraying not general; began 2nd July. Turnips very good, forward, very little damage from fly. Crows and jay thrushes are a greater destruction to turnip crop than the fly. Mangels good; leaves in some cases attacked by insect (not mangel fly); probably beet carrion beetle. Other green crops very good. Hay seeds and meadow very good; more clover in seeds than usual. Hay well saved. Pasture very good; unusual amount of white clover. The most promising crop season for many years.

Wheat very good; forward. Oats and barley very good, forward: some of latter lodged by rain. Other Co. Dublin. corn crops good. Potatoes very good; looking well; first earlies extra good; late earlies good; some fields have a deficiency of 10 per cent. to 25 per cent. owing to failure of seed. No blight in potatoes; promise of a good crop; little spraying. Turnips and mangels very good; no damage from fly. Cabbage good. Hay seeds and meadow very good; a late season for them; first and second years good; old meadow extra good. All fairly well saved. Some of the early meadows received damage from rain, and were troublesome and expensive in saving. Those cut later were saved in fair condition. Pasture very forward; most luxuriant growth for years past. Owing to rain in the month of June all crops are very forward. Grass a very heavy crop. Fine weather only necessary for an abundant harvest.

Wheat good; forward. Oats very good. Barley good. Potatoes good; late; no blight; no spraying. Turnips Co. Kildare. good, early; about 10% were attacked by fly, but recovered. Mangels good, early; little injury from fly. Hay seeds and meadow very good; fairly late. Hay well saved. Pasture good; quality extra good.

Wheat good; oats'good; slightly backward, but well coloured and vigorous; an improvement on last year's crop. BarCo. Kilkenny. ley very good. All grain crops doing well. Potatoes good; no blight; spraying not general. Turnips good; complaints in places of damage by fly, but largely recovered; considerable improvement on last year's crop. Mangels good. Cabbage good. Hay seeds and meadow good; new hay very good, but in some places lodged by rain; other meadows very good. Seeds hay has been nearly all saved in good weather. Produce variable; heavy where a full supply of clover; light where no clover. An occasional field of upland hay, that fell with the late rains, was cut. Pasture good; abundance of grass.

Oats good, especially on manured ground where kainit has been used. Lea oats rather stunted and poor.

King's Co. Barley good. Rye good. Potatoes very good, especially where sown from whole-started seed; no blight; spraying not general. Turnips good, especially where sown early; fly in places. Mangels good; not injured by maggot. Other green crops very good. Hay seeds good; suffered somewhat from drought; deficient in quantity; cut late owing to weather; well saved. New meadows good, well saved: old meadows and pastures very good.

Wheat little sown; very good. Oats very good. Rye good.

Potatoes very good; no blight; spraying is not

Co. Longford. general; began 9th July. Turnips good;

damaged by fly early in June; recovered later.

and looking well. Mangels good. Cabbage good. Hay seeds
and meadow extra good and very heavy; hay well saved so far.

Pasture very good; grass heavy.

Wheat more sown than usual; good; straw and head long. Oats good; growth thick; straw short. Barley very Co. Louth. good; growth thick; straw long. Potatoes good in some places; many misses; promise well on the whole; spraying not general, and where used has only just

begun. A slight indication of blight in early varieties in some places. Turnips very good; damage from fly in places, and lots re-sown. Mangels extra good; forward. Other green crops good. Hay seeds and meadow extra good; first crop has been well saved, but has, in some instances, from over-ripeness in consequence of bad weather in early part of season, been delayed in cutting; an unusually heavy crop. Pasture extra good; unusual abundance of of grass. Promise of exceptionally good season. Corn too thick on many farms owing to fear of grubs and germinating quality of seed.

Wheat very good crop, and well forward, but has been lodged in places by the rain. Oats very good; suffered during Co. Meath. April from wire-worm, but has thickened up since. Barley good. Rye, small quantity; extra good. Potatoes very good; at first backward; better now; free from blight; spraying not general; begun last week in June. Turnips very good; forward; those sown early part of May suffered from fly; others earlier or later not attacked. Mangels good; braird uneven. Cabbage very good. Hay seeds and meadow very good; fairly well saved so far. Pasture very good; abundance of grass.

Oats good, some damaged during cold weather in May by wire worm, but since then the crop has recovered Queen's Co. well; preshaugh is fairly prevalent. Barley very good. Same remarks as to wire worm and preshaugh apply here. Potatoes very good; somewhat slow at first, but have made rapid progress; some damage from frost on 29th June; one or two cases of blight; spraying not general; begun last week in June. Turnips good where sown early and land well manured; in some parts damaged by fly and drought; frost caused re-sowing. Mangels good; fairly well forward; little damaged by fly. Other green crops very good. Hayseeds very good. Meadows very good; well forward and heavy. Many older meadows, however, are rather dirty. Hay so far well saved. Pasture good, but has a good deal of weeds and inferior grasses.

Wheat little sown; good. Oats good. Barley very good.

Potatoes very good; alight attack of blight;

Co. Westmeath. spraying becoming more general in county than formerly; began about 4th July, and is going on speedily. Turnips very good; some early sown damaged by fly;

later sowing escaped owing to rain in June. Mangolds very good, especially early sown crops; no injury from fly. New and old meadows very good. Hay well saved so far. Pasture abundant. Preshaugh, unusually prevalent this year in corn crops, has caused considerable loss.

Wheat, large area, very good. Oats, winter black, very good; very heavy straw, but has suffered from rain.

Co. Wexford. Tawny oats very good; spring black, fair, injured by north and east winds. Barley good on manured ground; poor where sown on lea. Potatoes good; more people than usual spraying this season. Some blight in gardens; spraying not general; begun at the beginning of July; some fields sprayed before then. Turnips good, but in parts somewhat uneven. Mangels good; were damaged by fly and cold weather, but since the rain have recovered; somewhat late. Carrots good. Many complaints of parsnips missing. Hay seeds and meadow, some districts very good; others fair; ctop uneven; in many places long but thin; hay well saved. Pasture very good owing to rain.

Wheat little grown, but good. Oats backward in places, but heavy as compared with the last three or four Co. Wicklow. years; a good crop. Barley good, little grown.

A few small patches of rye for soiling purposes; these are good. Potatoes good; no appearance of blight; spraying not commenced yet as potatoes are somewhat backward; there are signs of an increased amount of spraying this year. Turnips, good braird; little trouble from fly, more damage from crows. Mangels fair, somewhat backward, not much damaged from fly. Other green crops good. Hay seeds and meadow very heavy crop; hay so far very well saved. Pasture abundant and good. All crops doing well, except potatoes, which are, in general, not a full crop.

#### Munster.

Wheat very good; suffered in places from wire-worm. Oats very good. Rye, considerable area, very good.

Co Clare. Potatoes very good; somewhat slow during early part of season; suffered in places from frost on 28th June. Blight has appeared in some districts about 6th July. Spraying carried out generally in the west of the county; begun last week in June. Turnips good; late sowing suffered from fly, but recovered with wet weather. Carrots good. Mangels very

good; suffered slightly from maggot. Cabbage very good. Hayseeds extra good; not over heavy. Old meadows very good. Early mown rye-grass suffered from rain. Pasture very good; much better than last year. The crops this year so far have been among the best that can be remembered in the district.

Wheat very good. Oats very good, but damaged on poorer soils by wire-worm, more particularly after potatoes. Barley average to good. Other corn crops very Co. Cork. good. Potatoes very good; some cases frosted early in season; disease appeared at end of June, but spraying is fairly general and began in middle of June. Turnips and swedes early and late crops good and escaped fly, but those sown end of May and early in June suffered from fly, and in many cases had to be re-sown; some damage from Diamond-backed moth and mildew (Peronospora jaranitica). Mangels very good; trifling damage from maggot. Other root crops good. Hayseeds and meadow fair, but hayseeds generally light crop owing to dry harsh weather early in year. Meadows very good. Hay well saved; some slight damage from rain in some districts. Pasture good, though poor early in season. As a rule crops are well above average, with the exception of hav, and, in some cases, barley. Cold weather in April and May delayed vegetation, but heat and moisture in early part of June improved matters.

Wheat very good. Oats very good. Barley good. Potatoes very good; backward till early in June; in Co. Kerry. gardens some blight end of June and early in July; spraying general. Turnips fair; attacked by fly about 25th June, but looking better now. Mangels very good. Cabbage good. Hayseeds meadow and pasture extra good. Pasture somewhat backward in May; very good since the beginning of June. Old mesdow a good average crop.

Wheat good. Oats extra good. Straw exceptionally heavy.

Barley good. Potatoes very promising; no

Co. Limerick. blight; spraying general; begun last week in

June. Turnips did not suffer from fly; later
fair. Mangels good. Meadows of every description in many places
extra good. Hay well saved so far. Cutting of meadow hay just
begun. First year's clover and rye grass very good; upland
meadow fair. Pasture very good.

Oats very good; the crop is thick and long; growth heavy.

Barley good; rather too much straw. Potatoes

Co. Tipperary. very good; forward; growth heavy; spraying
not general. Turnips promising well; early and
late sown good; some sown in first week of June attacked by fly
and had to be re-sown. Mangels very good; growth heavy;
slightly injured by fly, and checked by frost in places. Cabbage
very good. Hayseeds, meadow, and pasture extra good. Season
above average. Land well tilled on account of dry winter. June
rains brought on all the crops. Given fair weather ought to prove
one of the most productive years.

Oats very good; brairds injured in places by wire-worm, but have nearly quite recovered. Barley very good.

Co. Waterford. Potatoes very good; some blight beginning July; spraying not general; began first week in July. Turnips good; brairds injured in places by fly, crop having to be re-sown. In cases damage from mildew (Peronospora jaranitica). Mangels very good; forward; brairds came up strong. Other root crops good. Hayseed and meadow good and heavy, especially first crop; hay well saved. Pasture good in sheltered places; extra good in some districts; in others hardly up to average.

#### Ulster.

Wheat good; little grown. Oats fair; somewhat backward and short; the crop is a little late, but has improved Co. Antrim. owing to the favourable weather in Barley little grown; fair. Beans good and grow-Potatoes; those planted early look well and promise a very good yield; considerable number were sown late owing to wet season. No blight; no spraying so far; will commence in the course of a few days; is almost universally carried out. Turnips early sown well forward and crop good; others in places slow and back-Bulk of the crop sown in the middle of June just brairding; irregular; some thinned; re-sowing has had to be done in some cases owing to fly or unfavourable condition of seed bed. Mangels fair crop; slightly damaged by fly. Flax rapidly improving, but is a fortnight behind average; coming into flower rather too quickly; may be short; requires rain. Hay seeds and meadow good; a heavy crop in some districts, though scarcely average in others. Hay exceptionally well saved up to date; about three-fourths is kept for seed; seeding has not yet commenced. Pasture very good; 3 A 2

growth delayed to end of May, since when it has improved considerably. All crops doing well, but somewhat late owing to the rain and cold in the month of May.

Wheat fair to very good. Oats very good with the exception of those sown on lea soil. Potatoes average; backward early in season, but doing well at present; Co. Armagh. irregularly; some up some came late. No blight so far, which is unusual; spraying just commenced; about 90% of people spray twice, first about mid-July, second about mid-August; the remainder do not generally spray. Turnips average or fair; fly has done damage in places; early sowings look well; some present sowings and brairds look well; in some cases the crop is backward, and coming up very irregularly; requires rain. Mangels in places very good; in others backward and only fair. Flax more sown than usual; very good; rather forward. seeds and meadow very good; meadows in some places where topdressed or watered are a heavy crop. Most upland hay now well saved. Seed hay will be ready to cut from the 16th July onwards. Pasture abundant; in some places backward in May, but has come on considerably. Crops generally good, with the exception of turnips.

Wheat good and heavy. Oats light in parts, and others promise to be heavy. Rye very good. Potatoes

Co. Cavan. very good; not so good a crop for a long time; no blight; spraying general. Turnips good; damaged in places by fly. Mangels very good. Cabbage and parsnips fairly good. Flax good. Hay seeds and meadow good. Hay well saved. Pasture good. Crops of all kinds better than for some years previously. No failures. Corn crops are well forward, and promise a fairly early harvest.

ward; where boxed were a fortnight in advance of others, and no misses; complaints of misses general; tops light in general; no blight; spraying has begun; is general. Growth backward owing to wet and cold in month of May; since 1st June has improved somewhat. Turnips good, being thinned in places; some damage done by what. Turnips good, being thinned in places; some damage done by

fly which necessitated re-sowing; this also had to be carried out on some heavy and rough lands. Mangels good, especially in black soils. Other roots and green crops good. Flax very fair. Very cold month of May has given rise to a good deal of weeds. Hayseeds and meadow very good, probably owing to the mildness of last winter and rain in May; hay well saved. Pasture very backward at beginning of season, but has recovered since and is doing well. Crops generally backward this year in the whole county, especially in the mountainous parts rather than the inland districts.

Wheat very good. Oats average. Barley average. Corn crops somewhat late. Other corn crops fair; thin in Co. Down many fields; plants from cut seed affected with yellow blight in places. Disease has appeared in earlies in some parts. Turnips fair; earlies good; late sown attacked by fly. Mangels average; not so much fly as usual. Other roots and green crops fair. Flax good; rapid growth in June. Hayseeds and meadow good. Pasture good. Crops backward in May have come on since.

Wheat very good; very little grown. Oats good in places; in others only fair. On potato land the crop has Co. Fermanagh. been choked by "Spurrey" weed. Potatoes very good; backward during May, but grew rapidly in June; no blight; spraying not general; began 9th July. Turnips fair; backward; early and late sown injured by fly; many required second sowing. Mangels good; in places backward in growth owing to unfavourable weather in May; many misses and some complete failures. Cabbage good promise. Flax good; promise of good yield and good quality. Hayseeds and meadow very good; extra heavy; top-dressing has proved profitable. Upland hay well saved; meadow is being cut. Pasture very good; backward during May; improved in June; is now better than for some seasons back.

Wheat average; little grown. Oats good; backward early in the season; has made up since the rain in June.

Co. Lendonderry. Barley average; little grown. Potatoes good; somewhat late; no blight; spraying fairly general; began about second week in July. Turnips good generally; damaged by frost, drought, and fly in some cases, a few cases having to be re-sown. Mangels fair; little grown. Flax good; backward in May, but has improved since. Hayseeds and meadow good; backward early in season, and have much improved. Hay

almost all saved, and in excellent condition. Pasture good. Cold weather in May kept the crops backward, but general improvement took place during June, and there is promise of a good harvest.

Wheat good; little grown. Oats very good; heavy compared with last year. Barley good; not much sown.

Co. Monaghan Other corn crops good. Potatoes good; backward owing to late spring; some misses; blight appeared on 16th June; spraying general; commenced beginning of July. Turnips fair; backward; very few thinned. Mangels very fair; little sown; backward; some late owing to rain in May. Other green crops good. Flax fair; average crop; backward and late. Hay-seeds and meadow very good; heavy; hay-saving in progress. Pasture very good. All crops were backward early in the season but have come on latterly.

Wheat average; little sown. Oats very good; the lea crop was favoured by seasonable rain; sowing was completed early. Rye looks well, especially in bog Co. Tyrone. soil. Potatoes very good; extra good appearance of tops which were finished in good weather, and will be benefited by the late rain; no blight except in a few sheltered gardens; spraying is general, began first week of July. Turnips somewhat backward; great diversity in the crop; some damage from fly; fair to good. Mangels good, especially early sown; late sown attacked by fly. Cabbages good. Flax very good in places where sown early and sheltered from north-east winds; in others backward, but much improved by late rain. Hayseeds and meadow very good; some old uplands poor and low-lying meadows late. Hay saving in healthy progress; somewhat late growth in places. Pasture very good. Crops backward in May, but have much improved since.

# Connaught.

Wheat very good. Oats very good. Barley very good. Rye
fair. Potatoes very good; spraying adopted in
Co. Galway. some districts; blight began first or second week
of July. Spraying not general; commenced
early in June. Turnips fair, but suffered from fly. Mangels fair.
Other roots and green crops average. Hayseeds and meadow backward early in season, but have come on latterly, and are now excellent. Too much rain for hay-saving; little cut in some places so
far. Pasture extra good. Crops little backward, but the country
is looking very well.

Oats very good. Rye good. Potatoes good; blight about 8th
July; spraying began about 9th July. Turnips
Co. Leitrim. good; some damaged by fly during month of
June, but crop has improved since then owing
to favourable weather. Mangels good. Cabbage good. Hayseeds
and meadow very good; hay well saved up to now, but most old
meadow still remains to be saved. Pasture extra good; better than
last season.

Wheat good; little grown except for home use. Barley good; little grown. Rye good. Potatoes poor, except in some sheltered and dry situa-Co. Mavo. tion; crop is late this year. Blight has already made its appearance; spraying progressing since 1st July; stalks are soft. If the weather proves unfavourable to spraying the crop Turnips good; no serious damage from fly. will not mature. Mangels good; no serious damage from fly; not so well handled; not kept free from weeds; an excellent crop. Flax fair; only grown in a few districts. Hayseeds and meadow; little seed sown. There are, however, some splendid plots of rye-grass and clover; hay well saved up to now. Meadows are allowed to grow "natural grass," it is to a large extent weeds. Pasture, much variety; recently improved owing to heavy rain; damaged by cold temperature and cold wind; crop late and poor.

Wheat—winter wheat good; spring wheat backward; small area grown. Oats very good. Barley very good;

Co. Roscommon. little grown. Rye very good. Potatoes very good; stalks in splendid condition; no blight up to 9th July. Spraying rather general; began first week in July. Turnips good; no damage from fly. Mangels good; forward. Hayseeds and meadow very good, and heavy crop of new grass; hay well saved. Pasture very good.

Oats very good; no damage from wire-worm. Rye good;
heavy crop; Potatoes forward; extra growth of
Co. Sligo. stalks; good prospects. Blight rumoured in
some close gardens; spraying general and effective; began about end of June. Turnips forward; some severely
attacked by fly. Mangels forward; good promise. Cabbages,
carrots and parsnips extra good. Hayseed and meadow extra
heavy; has not been so good for years; rye grass or seed hay all
cut and well saved. Pasture very good. Promise of an abundant
harvest.

# SUMMARY OF FRUIT CROP REPORTS, JULY, 1906.

Reports have been received by the Department from correspondents throughout the country regarding the condition of the fruit crop at the beginning of July. The following summary presents the chief points of interest in the reports. A table also is appended showing the numbers and kinds of fruit trees and the total numbers of other trees planted, in nineteen counties, under the supervision of horticultural instructors, in connection with the Department's scheme of Instruction in Horticulture for 1905-6.

#### Leinster.

Gooseberries, abundant crop generally; mildew in some districts.

Strawberries, abundant crop, but not grown

Co. Carlow. in large quantities. Raspberries, small area, but crop good. Currants, not abundant, though fair yield; affected by "green fly." Apples very poor, except in sheltered gardens. Pears not planted largely; no crop except where sheltered by walls, &c. Plums, abundant crop in sheltered places. Damsons, not grown. Other fruits—Cherries abundant in sheltered places.

The fruit area seems to have neither increased nor decreased, but old trees have in many places been replaced by young stock. The old trees, which form the greater number, are much neglected: lichen is allowed to grow. In many places, particularly in small gardens, catch crops are grown, but in orchards, grass. Among the older trees, where not tilled underneath, blight is very prevalent. No spraying.

Gooseberries, average to good. Strawberries, good. Raspberries, good. Currants, good. Apples, very good.

Co. Dublin. Pears, plums, and damsons much injured by frost, below average. The area under fruit has increased since 1905. There are a number of young orchards, but the large proportion are old. Small fruits and catch crops are generally grown under the trees. Blight was prevalent owing to the cold winds. Caterpillars and aphis were very damaging during May and early June. Spraying is not general. Mildews very prevalent. The ermine moth caterpillar very destructive.

Few orchards of much extent in this county except those attached to gentlemen's gardens, but nearly

Co. Kildare. all with gardens have planted from six to twenty-four trees during past four years.

All the old orchards are in grass, but now since the experiment plots were started and people see the amount of farm produce and vegetables that can be grown between the trees, all planting young trees are cultivating the ground. Little spraying is done for blight, insect pests or cleaning trees of lichen and moss. Gooseberries heavy crop. Black currants good crop. Red Currants heavy crop. Raspberries very heavy crop. Strawberries very heavy crop. Apples under average crop. Pears bad crop. Plums bad crop. Damsons bad crop. Fruit trees and bushes never promised better, but frosts during April and May, and harsh weather has left all the tree fruits a light crop, and currants have suffered from aphis.

Gooseberries, few; badly attacked by caterpillar. Fruit buds
eaten by birds in early spring. Strawberries; good on heavy soil, poor on light.
Red and white currants average. Black
currants good. Cherries damaged by frost and canker; fair in
places. Apples average. Pears average. Plums very few.
Damsons very few; below average. Other fruits very good.

Slight increase in fruit area this season. Some young orchards good. Trees are planted with grass or on cleared spaces of grass land; in other cases they are set in gardens with potatoes. Old orchards mossy and cankered; suffering from American blight. Little small fruit grown under trees, the practice in places being to mow the grass twice a year for soil. Spraying not in practice.

Gooseberries good. Strawberries good; late. Raspberries good; better than last season. Red and white King's Co. currants fair to good. Black currants average to fair. Apples, pears and plums, excellent promise, but some early trees were damaged by frost. Cherries, very few; below average. Slight increase in orchard area. Most orchards are old. Grass chiefly grown under fruit trees, but small fruit in gardens. Some cases of blight; these have received treatment. Spraying not general.

Little fruit grown for market. The area under the various fruits has not increased this season. Co. Longford. of the fruit gardens and orchards are old and not very highly cultivated. grass or vegetables generally grown under fruit trees. Canker is prevalent among apple trees, and black currant mite has appeared. Spraying not general. Gooseberries fair quantity and good size. Strawberries great show of blossom, but weather seemed to prevent a great deal of the fruit forming; crop prospect average. Raspberries promise abundant crop. Red and white currants promise fairly. Black currants—many of the newer bushes nearly quite blighted; old bushes promise well. Several bushes severely cut last autumn. Those sprayed with sulphate copper and soda look much better; others left untouched seem almost dead, though only two years planted. Apple trees blossomed in profusion, but the sharp nights of spring destroyed fruit in many cases. Many trees quite blighted, and on the other hand many overloaded with fruit; on the whole there is promise of an average crop. Many early blossoms blighted. In some cases where manured and sprayed this winter, the apples show a better colour and size, but the best results are with heavily-cut trees from fifteen to twenty years old. Young trees from four to nineteen years are not showing so much promise.

Gooseberries good. Strawberries not much grown, good. Raspberries average. Apples poor. Plums and damsons poor. Pears scarce.

Gooseberries good. Strawberries fair. Raspberries good. Red and white currants fair. Black currants good. Apples fair; more plentiful on older trees. Pears fair. Plums good. Damsons poor. Apples, pears and plums damaged by frost. No increase in area under fruit. Old trees much damaged by late storms, and a number of young trees have been planted instead. Catch crops are grown under fruit trees in nearly every garden. Blight and mildew prevalent. Poor prospect for fruit in general.

Gooseberries, strawberries, raspberries, currants and apples good crop. Pears, plums and damsons very little Quesn's Co. good. Pears and plums bloomed very nicely, but cold spell seemed to destroy flower.

The apple trees planted within last ten years bear very superior

fruit. Bramley's seedling, Ecklingville and Lord Grosvenor do especially well.

The area under fruit has increased. Most orchards are old and trees not properly cared for and in decay. Catch crops and fruit in new orchards, but grass only in old ones. No blight; no spraying. General yield will be good.

Gooseberries good; in places attacked by green fly and caterpillar. Strawberries fair. Raspberries fair;

Co. Westmeath. some cases of blight. Currants good. Black currants good. Currants have been attacked by green fly and caterpillar in places. Apples good. Pears, plums and damsons better on walls than on bush trees. Plums and damsons carry heavy crops in alternate years, as the heavy crop is left on one year and exhausts the trees against the succeeding year. Cherries good.

Slight increase in fruit area. Most orchards are old and have been neglected in the past. Some young trees. Grass generally under trees. An improvement is taking place. Blight not very prevalent. Spraying not general. Some have tried it and with success. Great variation in production. Bad in unsheltered places.

Gooseberries good. Strawberries good. Raspberries good.

Red and white currants poor. Black curCo. Wexford. rants fair. Apples, some good. Others
average or poor; damaged by frost. Pears
average to good. Plums bad; damaged by frost; below average.
Damsons poor. Cherries poor; bad for some five years past.

In places there are some young orchards well cared for and sown with small fruit and vegetables. Many old orchards were flourishing forty-five years ago; now only stumps of apple trees. Moss, lichen and American blight common in gardens. Spraying in places, especially in young orchards. Good promise of bush fruit yield.

Gooseberries, raspberries and strawberries are an abundant crop; there is a lack of sweetness in some Co. Wicklow. of the strawberries this season. Red and white currants abundant, but the bud mite has damaged the black currant in some places. Apples, pears and

plums an average crop. Cherries profuse in blossom but dropped at stoning season through drought. Black fly, green fly, sawfly and woolly aphis have been prevalent.

#### Munster.

Gooseberries very good. Strawberries very good. Raspberries very good. Red and white curants very good. Black currants good. Apples good; above average. Pears fair; very few grown. Plums bad in most cases. Damsons very few grown. Other fruits—cherries never successful in this county; peaches much damaged by late frosts and wind and wet.

Except for plums, this year is very good for all classes of fruit. The apple crop should be above the average. Where ordinary care was taken there is little damage from caterpillars to gooseberries, etc. Plums appear to have done badly everywhere from a species of blight. No increase in area under fruit. All the new orchards are beautifully kept, and look most promising; the owners take great interest in them. The old orchards are not of much value, trees generally being very old. There are not many orchards of any sort amongst the farmers in this county.

In the new orchards small fruit and catch crops are grown under the trees. In the old orchards grass is generally grown; there does not appear to be any change. Plums where grown appear to have suffered from blight badly. Spraying is never resorted to except in a few gentlemen's gardens.

Gooseberries very fair; a week late, owing to bad May weather.

Strawberries poor; some one or two-year-old

Co. Cork. plants did well. Raspberries below average;
small. Red and white currants poor;
small; scarce. Black currants much injured by fly. Apples fair;
some earlies blighted; would have been heavy crop but for bad
weather in May. Plums, pears, and damsons poor.

Small increase in fruit area. In some old orchards new trees are being substituted for old. Catch crops generally grown between trees; grass in many orchards. Gooseberries attacked by caterpillar. American blight and mealy bug on old trees. Fruit but very little sprayed.

Gooseberries very fair. Strawberries; earlies below average;
small suffered from drought. Raspberries
Co. Kerry. average. Red and white currants fair.
Apples below average. Pears fair. Slight increase in area. Some old orchards well kept; good produce. Young trees replacing those in old orchards. Blight in early fruit; several orchards only half a crop. Spraying not general. Shelter generally. Crops generally have suffered from drought and north winds.

Gooseberries good in sheltered situations. Strawberries average, but late; affected by cold hard winds. Currants good in sheltered situations. Apples good. Pears and plums scarce. Slight increase this year in fruit area. Many orchards old; in places about an equal division of young and old trees.

Grass is generally grown between trees, especially the old trees. Catch crops under young trees. Blight; slight attack. Also moss on old trees. Liming carried out last spring. Many will spray this winter with caustic solution.

Gooseberries very good. Strawberries very good. Raspberries good. Red and white currants good.

Co. Tipperary. Black currants good. Apples very good. Pears very good on walls; poor on standards and bushes. Plums very good on walls; very poor on standards. Damsons few; bad. Cherries poor.

Slight increase in fruit area. Orchards mostly old, mossy, and cankered; are being replaced by new plantations. General condition of old orchards is bad. Young orchards in a healthy condition. Graes grown in old orchards. Small fruit and catch crops in new orchards. Pears attacked by "pear gall mite." Green fly very bad on currants and gooseberries. Codlin moth in places. Spraying not general.

Gooseberries good. Strawberries good. Raspberries good or medium. Red and white currants good to co. Waterford. Medium. Black currants very good. Apples good. Pears good; not generally grown. Plums and damsons below average. Figs; outdoor; good. Peaches good. Slight increase in fruit area. Many

orchards old. Apple orchards not so good as formerly. Old orchards are under grass. New plantations under catch crops and some bush fruits. Gooseberry mildew. Spraying done on diseased fruit.

#### Ulster.

Bush and small fruit little grown for the market. Crop this year varies from light to medium. GooseCo. Antrim. berries, red, white and black currants, light to medium. Strawberries and raspberries not much grown for the market; crop fair to good. Apples medium to light crop. Pears, some almost a failure; others a fair crop. Plums and damsons showed abundance of bloom; crop almost a failure in places. Cherries not generally grown; crop very light.

A very small increase in planting has taken place this season. Most orchards are now replanted with young trees; a few of the old still remain. The ground around young fruit trees is usually cultivated for a few years and then put down in grass. A sort of mildew or blight which caused the leaves to curl, appeared on some trees last season, but blight is not prevalent to any appreciable extent this season.

The area under fruit being so large and the industry so important in this county, five reports have Co. Armagh. been obtained from several districts in the Lurgan: -- Gooseberries small incounty. crease in area; poor. Strawberries, small increase; good. Raspberries no change; middling. Currants little grown; middling. Black currants no change; fair. Apples about 20 per cent. increase; crop in early varieties a failure owing to unfavourable weather at time of bloom; late varieties about one-fourth crop, owing to unfavourable spring. Pears no increase; this fruit is very little grown here, as only some seasons produce crops. Plums, damsons and other stone fruit, practically no change in area: these are all failures this season. On the whole the area under the various fruit has increased slightly, say about 10 per cent. About half of the orchards are old and the remainder young, the latter being planted within the past fifteen years. In smaller orchards catch crops and small fruits are usually grown; in the larger orchards grass. Blight is not prevalent, and little spraying is done. In the case of apple trees some scrape and lime-wash the trunk and branches of the trees. Yield on the whole poer

Moy: -Gooseberries fair crop, but small. Strawberries none grown. Raspberries will be few. Red and white currants bad crop. Black currents a fair crop. Apples almost a total failure generally. Pears, no fruit this year except a small quantity. Plums and damsons in district a total failure. The fruit this year is very late, much smaller than at this time other years; the late frosts and north and east winds cut off all the bloom on damsons and plums. Many orchards are treated unprofitably, large areas being planted but the trees being allowed to starve for want of dung and grass being allowed to grow around them. Loughgall: -Gooseberries are a very good crop this season, especially the "Whinham Industry" and "Red Warrington." Strawberries are abundant. Raspberries are also a heavy crop. Red and white currants not much grown. Black currants are not a general crop; in some fields they are good and in others scarcely any. Apples are very scarce, except some of the older and late kinds; the more modern sorts are almost a failure. Pears also, except some very late sorts. Plums none, only on the younger trees. Damsons a complete failure. The area under fruit has increased about 20 per cent.; this is especially noted in strawberries, apples and raspberries. The general condition of orchards are good, almost all young: the old ones have been replaced by young trees. Grass is generally grown where the trees have got a standing; manure spread around in winter. In some cases potatoes are grown under the trees; the cultivation of small fruit is resorted to, until the trees get too large to be profitable—a marked change in this respect. Blight is not very prevalent; trees are all in a healthy condition; on some trees there is a small grub, about half an inch long, green colour. Spraying is not general; only a few here spray the trees, others throw slack lime upon them when damp. Fruit growers in this district have of late years given great attention to their fruit orchards, pruning and manuring. If spraying were followed up as well great benefit might accrue therefrom. Spraying should be done early, while the insect is in an embryo state; it would then be more easily destroyed; in many cases its ravages are not detected until too late to remedy. Richhill, Loughgall and Annaghmore: - The area under apples, strawberries, raspberries and currants has increased, doubtless both collectively and individually. The gooseberry area is pretty much at a standstill. The acreage of increase is probably 200 acres or more.

Old orchards are dying out and disappearing steadily, or being re headed in new kinds; the loss is, however, far more than covered by new plantations. An increasing tendency exists to cultivate under fruit trees, which are largely planted among bush and ground fruits as an under crop. Larvae of various kinds-apple sucker and weevil, black current mite, &c., do much harm; some are endeavouring to combat by regular spraying, &c., which, however, is only partially successful. The gall-mite is very hard to do away with, but it would be well to try and find an effective antipest. Crop prospects are good for strawberries and raspberries if they get enough rain. Black currants are under the average. Apples a very poor crop, except where situation has been particularly favourable, especially the better kinds. Pears scarce. Plums very scarce. Damsons almost nil. Gooseberries average crop. Loughgall: -Gooseberries light crop, and area rather declining; profitable this season, but comparatively little interest taken in their cultivation now. Strawberries holding their own in extent and expected to do very well. Area subject to modifications owing to the constant exhaustion of parts some time in cultivation. Attacked by a borer which works underneath the flower bunch and pierces it in a manner that causes death of the flower above. The growers do not consider it an unmixed evil as they count on the remaining bloom turning out more prolific and inducing better quality fruit. Only a few see the thing at all, and do nothing to abate it. Raspberries, extent increased and crop this season only moderate, and in parts not expected to be that; result greatly in doubt yet, as so much depends on weather at the ingathering of the crop, a wet spell being advantageous. No observations made yet in this district on insect or fungoid enemies. Black currants being grown more largely than before, though area has not increased past twelve months; prospect fair, but growers know of the great enemy of this fruit—the mite--and are in dread of it; it is spreading, and expected to spread further. No really effective measures taken, and some plantations have had to be removed. It was imported. and would soon settle the prospects here. Apples, the greatest failure for perhaps a generation, though last year's great prices caused an immense addition to the young plantations in winter. About one-tenth of a crop probable; and this disaster has been caused primarily by the adverse climatic conditions, while caterpillar and insect attacks (the winter moth and apple sucker) completed the destruction. Small fruits are grown under the young plantations when grown at all; in other parts grass and all kinds of crops are sown without any understanding of likely injurious effects. Hay and corn are as common as anything else, with results that intelligent observers can easily see to be harmful in after years. On the other hand may be seen rank unfruitful growth produced by excessive manuring of young trees in small fruit plantations, and where root crops are continuously grown. Scientific fruit growing is not yet much understood, and while there may be less grass grown than formerly in new orchards, quite as much other baneful crops are sown in them. Old orchards fast dying out in these parts; what remains of them much better "hit" this season than those containing new sorts, or of youthful Spraying increased among apple growers, but the right mixtures very seldom used, and the whole business consequently derided. Hardly anybody believes in it, though more growers tried it this spring than ever, but local prescriptions were generally used, and no apparent good came of it. The pests already referred to are increased alarmingly, and within the next few years either they or the fruit growers must go down.

The area under small fruit has increased slightly this season.

Strawberries not planted. The area under

Co. Cavan. apples has increased; the number of pears,
plums, damsons and cherries planted, small.

Pears, plums, and damsons do not thrive owing to frosts and wet land. Orchards hardly exist unless this word is taken as describing small lots of fruit of in or about twenty trees, mostly found in Belturbet district (some in Stradone district). These are almost, without exception, old, cankered, moss-grown, and bad quality trees. Even under the most adverse circumstances of cultivation some excellent crops of cooking apples are produced. Few young orchards of healthy trees exist. Grass is grown quite close to the trees in the old orchards—no cultivation of any description taking place. Spraying not general. The following sprays have been most successfully used in this county: caustic soda and potash, Paris green and Bordeaux, soft soap and paraffin, sulphur and caustic soda. Prospect of gooseberry yield excellent, but in all cases attack of caterpillar has had to be dealt with. Half and quarter of usual crops of apples are reported from various parts of the county. Plums

and pears almost complete failure. Currants under average. Strawberries good, but plants unhealthy.

The area under fruit has increased somewhat this season. A great many very old uncared for orchards;

Co. Donegal. the orchards commenced under the superintendence of the Congested Districts Board are being well kept, and are doing very well. Under the fruit trees in the old orchards, grazing or meadow; in the new orchards, catch crops. Very little blight, and spraying is not practised, although very much required in the old orchards. Gooseberries fair. Strawberries and raspberries, very few cultivated, and generally in a very rough state. Red, white, and black currants a fairly good crop, but berries very small. Apples and pears a failure, owing to the storm at the time of blossoming. Plums and damsons not grown here.

Gooseberries fair to poor. Strawberries good. Raspberries good. White and red currants fair. Co. Down. currants and plums fair; attacked by aphis. Pears poor. Damsons few grown. increase in bush fruit area; larger under trees. Orchards old and neglected. Most fruit grown in gardens. The older trees are being removed and young trees planted. Grass, small fruit or catch crops grown in nearly every case. Where small fruit or catch crops are grown the tendency is to plant further from the apple trees than heretofore. Old orchards under grass, and in some new plantations the grass is kept away from over roots. There is a tendency to sow more catch crops. American blight very prevalent in some districts on the later trees; also canker. tried and with success in a few places. Winter moth, apple-sucker, and gooseberry caterpillar active. Most plum and pear blossoms spoiled by frost in early part of June.

Bush fruits — Gooseberries good crop.

Raspberries scarce. Red and white currants

Co. Fermanagh. good. Black currants medium. Tree fruits

—Apples almost a complete failure, except
late blooming kinds, which promise a full crop. Pears very little
grown; almost a failure. Plums a failure, except on well-sheltered
walls. Damsons a failure. Area under apples has increased by
about twenty acres. Most orchards are old, starved, and worn
out. Several young and starved orchards on grass have been

improved by mulching, hoeing, and keeping a space of eight inches round each tree free from weeds. Several orchards have been planted on tillage land and the interspace cropped with potatoes, turnips, etc. Winter moth (Cheimatobia Brumata) is the principal enemy with which the fruit grower has to contend. Grease banding was resorted to by three growers on a total area of seventeen acres, but owing to delay in applying the bands, and subsequent carelessness in keeping the same in a sticky condition, although large numbers of female moths were caught, many had ascended the trees and deposited eggs. The same trees were sprayed twice at the end of February and beginning of March with caustic alkali as follows:—1 lb. caustic soda, 98%, 1 lb. pearl ash, 3 lb. soft soap, 10 gallons water. The bark has been cleared of slime and lichen, but the spraying seems to have no effect on the winter moth, as they were still so plentiful as to be injurious. Black currant gall mite does not exist except in bushes which have been recently planted. Gooseberry mildew in one case.

Gooseberries below average; fair or good; small. Strawberries average; fair; very late. Currants below Co. Londonderry. average; small and late. Raspberries promise well. Apples below average; small; irregular. Pears and damsons not generally grown; below average. Plums small; irregular. Slight increase in fruit area. Orchards not general. Grass is grown under apple trees. In places bush fruit between trees. Trees stripped by north-west wind. Little blight. A few spray.

Gooseberries, strawberries, raspberries, red and white currants and black currants, very good. Apples Co. Monaghan. fairly good. Pears fair; there are not many trees grown. Plums fairly good. Damsons average to good.

To judge by the number of trees planted during past season, the area has increased by thirty to forty acres. The young orchards are in a most satisfactory condition; the old as a rule are not, except where headed down and regrafted. Most of the orchards are young. Where the plantations are of any great extent they are on grass; in the smaller, bush fruit, potatoes, etc., are grown. There is, in many cases, a desire to change, but the difficulty of obtaining help prevents it from being carried out. In the old orchards, apple scab, canker, etc., are generally to be met with, but as these bring little or no profit spray-

ing is not general. Spraying has been carried out lately in connection with attacks of apple-sucker on trees in new plantations that were made in close proximity to old and neglected ones. Spraying has also been carried out during winter and early spring for cleansing trees of foul growth, lichen, mosses, etc., also to prevent birds from eating out the flower-buds in their early stages.

There has been an increase of about forty-five acres under tree fruits. Most of the orchards are old trees. In most cases the orchards are in grass, with Co. Tyrone. the exception of a few at Cookstown, Strabane, Dungannon, and Clogher districts, which have been recently planted. Apples average. Pears bad. Plums bad. Gooseberries below average. Black currents good. Raspberries medium. Strawberries will be a short crop. Diseases are numerous. Apples, canker spot and mildew, winter moth and scab. Pears, canker spot and pear midge. Gooseberries, American mildew, cluster cups and saw fly. Plums. pocket plums and silver leaf. Strawberries, mildew. In some districts the trees have been sprayed during the winter months with the caustic spray, and liver of sulphur has been used during spring and summer months.

Connaught.

Gooseberries fair; generally grown; small. Strawberries good.

Raspberries average good or fair. Red and
Co. Galway. white currants good. Black currants good;
black bud very prevalent during last few
years. Apples good; great improvement in past few years; many
young trees planted. Pears good; little grown except in large old
orchards. Plums bad. Slight increase in fruit area. Most
orchards are old; only a few young. Old orchards under grass.
Catch crops under new fruit trees. A few cases of American blight,
canker, and black bud. Spraying not general.

Gooseberries, strawberries, and raspberries, fair average crop.

Red, white, and black currants, apples, pears, plums and damsons, average crop.

Gooseberries very good. Strawberries good; late. Raspberries
very good. Red and white currants good.
Co. Mayo. Black currants very good. Apples fair;
damaged by frost and high wind in May.
Pears very few. Plums average. Damsons bad. Walnut, Logan
berries, Japanese wine berries, good. Large increase in apple area;
alight increase in other fruit. About five-sixths of orchards are

old; generally neglected, but some excellent apples. Old orchards under grass; new orchards under catch crops. Little blight, spraying not general.

Gooseberries good; attacked by caterpillar; in some places mildew. Strawberries good. Raspberries

Co. Roscommon. fair. Red and white currants good. Black currants good. Apples fair or inferior; injured by frost. Pears bad; injured by frost. Plums fair. Cherries good.

No increase in fruit area. Orchards mostly old and neglected. Old orchards under grass; new orchards under vegetables. No blight; no spraying.

Fruit trees damaged by storm in June. Some blight apparent on black currants. Old orchards under Co. Sligo. grass. New orchards under catch crops. No spraying.

SCHEME OF INSTRUCTION IN HORTICULTURE, 1905-6. List showing the Numbers and Kinds of Fruit Trees and the Numbers of other Trees planted under the Horticultural Instructors' supervision in Nineteen Counties.

County.	Apples.	Pears.	Plums.	Dam- sons.	Cher- ries.	Goose- berries.	Cur- rants.	Rasp- berries.	Other Fruits.	Other Trees, &c.
Cavan, .	1,519	23	135	13	3	214	96	50	_	125
Cork,	504	8	3	-	-	236	212	100	-	-
Down,	4,443	49	143	8	-	2,962	386	804	974	3,274
Fermanagh, .	2,327	7	46	-	-	240	54	236	-	17,282
Galway,	963	33	148	-	-	368	98	18	-	2,952
Kerry,	361	24	10	-	-	82	12	48	100	2,852
Kildare,	1,507	314	475	2	11	1,825	677	40	-	33,861
Kilkenny, .	3,691	289	169	63	30	939	316	580	365	3,288
King's,	1,257	59	84	2	2	363	244	403	536	2,920
Limerick, .	501	53	51	-	-	360	216	222	1,158	3,428
Мауо,	1,306	31	25	-	-	60	252	96	298	20,928
Monaghan, .	1,970	3	52	13	-	146	30	50	-	474
Queen's,	651	135	136	6	48	106	286	161	126	6,494
Roscommon, .	532	1	7	-	-	30	-	-	200	2,350
Tipperary, N.R.	237	108	46	12	-	108	368	962	72	5,254
" S.R.	5,552	196	81	-		1,177	592	100	1,300	26,077
Tyrone,	1,142	75	65	-	5	380	98	375		6,408
337 n A mark a suid	( 786	36	649	24	2	793	702	403	1	5,682
Waterford, .	367	10	16	-	-	112	24	-	-	1,490
Westmeath, .	1,099	122	229	-	91	627	258	382	325	4,621
Wexford,	2,472	-	6	-	-	1,829	312	417	1,636	9,217
Totals, .	33,136	1,512	24,76	143	122	12,457	5,283	5,447	7,091	158,907

# FOREIGN LIVE STOCK AND DEAD MEAT IMPORTS INTO THE UNITED KINGDOM.

There are many points in connection with the development in recent years of the foreign and colonial trade in live stock and dead meat which deserve the careful attention of Irish farmers. Important changes have been and are taking place, and it is necessary that a wide view of the situation should be taken. The two sides of the trade, the live stock and the dead meat, must be considered together. To look at the live stock trade and neglect the dead meat trade is to miss half the problem, and that which threatens to become the more serious half.

Every year brings these two sides of the trade into closer relations with one another-and the home grown and Close connection home killed trade has now to reckon with on the between the imports one hand the import of fat cattle for slaughter of Live Stock and of at the ports of entry, and on the other hand Dead Meat. a growing import of "chilled" and of "trozen" meat. The import trade is thus entirely one in "the finished article," and while that article varies widely in quality and price, from the cheap frozen South American tore quarters to the Birkenhead and Deptford fresh killed sides, prices in one quality are to some extent affected by prices in the other. Also while it is true that the prices of the best qualities of home grown beef have been less influenced by foreign supplies, the poorer cuts of the home grown beef come directly into competition with foreign and colonial meat, and lessen the total selling price of home grown beasts.

There is a further consideration which should not be overlooked.

There are conditions of "keep" and of "market"

The Prices of Beef which temporarily and locally affect the prices of every class of cattle—stores, half-fat and fat.

But the price of beef is what ultimately deter-

mines prices throughout in the cattle trade. When there is free competition, and an abundant supply of the finished article, the price of the finished article determines the price of the half-finished product. The price of beef sooner or later determines the price of "stores." What in turn determine the prices of beef are the supply of it and the demand for it. The supply is determined by the relative cost of production in the several countries, while the demand varies with the

price, increasing as the price falls. Thus the cheapness of the supplies of foreign and colonial frozen meat has unquestionably increased the consumption of meat among a large class of the population, and this increased demand has saved prices from falling further. On the other hand the fact that the supplies of fresh beef and mutton of the highest quality are not easily increased is of great importance to the home grown and home killed trade. The bearing of these general considerations will be brought out by considering the development in recent years, first, in the import of live stock, and, second, in the trade in chilled and frozen fresh meat from foreign and colonial countries.

The imports of live stock from foreign and colonial countries have fluctuated considerably as regards number and value in the past twenty years, as shown in the following statement:—

Numbers and Values of Live Cattle, Sheep and Pigs Imported into the United Kingdom from Foreign and Colonial Countries during the Years of 1885, 1890, 1895, 1900, 1905.

			Numbers.			Value	B&.	
Yea	r.	Cattle.	Sheep.	Pigs.	Cattle.	Sheep.	Pigs.	Total.
		No.	No.	No.	£	£	£	£
1885,	•••	373,078	750,886	16,522	7,046,477	1,625,029	63,248	8.734,754
1890,		642,596	358,458	4,036	10,505,525	696,312	14,474	11,216,311
1895,	•••	415,565	1,065,470	321	7,183,040	1,782,544	668	8,966,252
1900,	•••	495,645	382,833	-	9,012,194	610,125	-	9,622,319
1905,	•••	565,139	183,084	150	9,665,806	278,753	<b>30</b> 0	9,944,859

From the above figures it will be seen that the trade in live stock while it has fluctuated has not increased in im-

Imports of Live portance. If the imports for each year since Stock into the United 1885 were examined, it would be seen that the Kingdom. highest total value recorded was in 1897, amounting to £11,380,492. The trade there-

fore in live stock may be said to be in a fluctuating condition, whereas the dead meat trade has been in a rapidly expanding condition. The live stock trade, has, however, undergone considerable changes in recent years. The import of live pigs has almost ceased. The import of sheep and lambs has greatly decreased, and in 1905 amounted only to 183,084—five-sixth of this number coming from the United States. In 1905 the import of sheep from Ireland into Great Britain amounted to 700,626. While this decline has taken place in the number of

sheep and pigs landed from abroad, the imports of cattle from foreign and colonial countries, allowing for temporary fluctuations, have not greatly changed. The year 1890 is the high water mark in this trade when the number reached 642,596, valued at £10,505,525. Since then the import has fluctuated considerably, but in each of the past three years it has considerably exceeded 500,000 in number and £9,000,000 sterling in value. In 1905 the returns show the number imported to be 565,139 and the value £9,665,806. All these cattle were fat and were killed at the port of entry. Roughly three-fourths came from the United States and one-fourth from Canada. No live cattle have been imported from the Argentine since 1903.

As regards quality and condition, the cattle imported from the United States and Canada are mainly of a Quality and condition cross-bred shorthorn type with an occasional of imported cattle. consignment of black polls (chiefly Aberdeen Angus) and a few Hereford Crosses. The majority are bullocks of very good quality, thick low set beasts, especially well fleshed about the loins and down to the hocks. A few fat bulls and old cows are also shipped, but such low grade beef forms a very small part of the cattle imported. In the earlier part of the year the cattle to be seen in the lairs at Birkenhead, Deptford, and the other ports of entry, are largely stall-fed or corn-fed (maize) on grass. Ranch (grass fed) cattle which arrive from July onwards are usually rougher in character, of poorer quality, and much wilder.

In general the States cattle are of better quality than the Canadian. The animals from both countries have not improved greatly in quality during the past 10 or 12 years, but the opinion of salesmen and of buyers seems to be unanimous that beasts are now much better finished than some few years ago. This is more noticeable with regard to shipments from the eastern portion of Canada. The condition of the animals to be seen in the lairs would not generally be classed as prime but suits well the requirements of butchers. Very fat cattle are not now greatly in demand and the shippers across the Atlantic are aware of this fact. Most of the bullocks sent are dishorned and are from  $2\frac{1}{2}$  to 3 years old. Occasionally one meets with choice cattle 2 years old.

As to transit, during the sea voyage great care is taken of the cattle. The average loss is a fraction of 1 per cent. On the steamers all cattle are tied by head ropes in pens of four or five and each beast is allowed a space of 2 ft. 6 in. to 2 ft. 8 in. wide by 8 ft. long and 5 ft. 6 in. to 6 ft. between decks An attendant must be provided for every 25 to 35 head, according to the facilities for watering. Quiet stall fed cattle will

improve in condition during the voyage. Ranch cattle fret and usually lose condition from the time they leave their pasture to the time they are killed.

With regard to the cost of transit, the shippers in Chicago or other

Transit and organisation in the Transatlantic Cattle Trade.

American stockyards contract for space on the steamboats for periods of some months, and have, therefore, to pay freight whether sending cattle or not. The cost of shipping cattle from Chicago to a British port amounts

to about £4 per head, and this includes freight, insurance, food and attendance. American shippers have their own representatives at the ports in Great Britain, though some cattle from the States are sold by commission agents, as is done with Canadian cattle. The method of sale differs in the various ports. In Birkenhead and Manchester the cattle are sold per pound of beef, and the importers employ their own butchers and deal with the offal. In Glasgow and Deptford the cattle are sold as they stand in the lairs, i.e., as cattle are sold in the ordinary market. In these cases the buyers pay the slaughter-house hands and sell the offal.

In Birkenhead and Manchester there are very good cold air rooms, where, for a small charge, sides of beef are chilled in hot weather previous to being sent away by rail or otherwise. railway runs alongside the cooling and chilling rooms, whence dead meat waggons are forwarded to any part of Great Britain.

Prices of American and Canadian Cattle.

As to the value of American and Canadian cattle, the most saleable beast is one dressing 700 lbs. of beef, and the majority of the bullocks will be of this weight. The salesmen calculate them to kill 52 per cent. of their live unfasted weight as beef. At the time of an inspec-

tion recently made by an officer of the Department, Canadian cattle at Birkenhead realised in some cases £17 10s. each, and States cattle in Glasgow were making up to £21 10s. per head. On the average, the prices realised for Birkenhead and Deptford sides are very similar to those for home-grown beef, except the choicest qualities of the latter.

To illustrate the changes in the imports of cattle the appended diagram I. (p. 708) shows the numbers of foreign and colonial cattle imported into the United Kingdom in each year since 1885, and also the import of Irish cattle into Great Britain in the same

years. The total number of cattle exported from Ireland to Great Britain in 1905 amounted to 749,131, of which number 224,943 were returned as "fat."

Turning to the question of the supplies of fresh meat, the increase which has taken place in this trade may be seen from the following summary of the quantities and values of the Fresh Beef, Mutton, and Pork imported into the United Kingdom in the years, 1885, 1890, 1895, 1900, 1905.

			Quantities.	j		Valu	108.	
Yea	rs.	Fresh Beef.	Fresh Mutton.	Fresh Pork.	Fresh Beef.	Fresh Mutton.	Fresh Pork.	Total.
		Cwts.	Owta.	Cwts.	£	£	£	£
1885,		902,951	572,868	70,508	2,345,415	1.486,317	184,952	4,016,684
1890,	•••	1,854.593	1,656,419	45,249	3,923,015	3,447,776	109,764	7,480,555
1895,		2,191,037	2,611,435	288,284	4,275,548	4,595,678	664,946	9,536,172
1900,	•••	4,128,130	3,392,850	695,395	8,162,848	5,841.566	1,495,393	15,499,807
1905,	•••	5,037,521	3,810,969	505,633	8.931.593	7.336.490	1.162.370	17,430,443

The supplies of fresh mutton (frozen) are shipped almost entirely from New Zealand, Australia, and the Argentine.

It is, however, with the import of fresh beef that we are at present mainly concerned. There are two countries from which nine-tenths of the total quantity is shipped, namely, the United States and the Argentine Republic. The supply from the United States has hitherto been the larger in quantity, but in recent years their export to the United Kingdom has been, with fluctuations, falling, while the export from the Argentine Republic has

Supplies from the 1905 the export from the Argentine ex-United States and ceeded, for the first time, that from the the Argentine Republic. United States, as may be seen from the following figures:—

Imports (in cwts.) fresh beef into the United Kingdom from-

The United States, 2,395,836 2,232,206
The Argentine Republic, 1,675,271 2,580,152

The increasing lead in this import which the Argentine Republic is obtaining may be further seen from a comparison of the figures for the first six months of 1905 and 1906:—

		1905 (6 months). cwts.	1906 (6 months). cwts.
The	United States, .	1,124,888	1,228,743
The	Argentine Republic,	1,183,375	1,517,103

The import of beef from the United States is almost entirely "chilled"; that from the Argentine Republic, till within recent years, almost all "frozen." But in 1905 the import in the quantity of "chilled" beef from the Argentine has very considerably increased, and is now estimated to amount to one-fourth of the total Argentine shipments of fresh beef. Thus the Argentine Republic, which is the great source of supply as regards frozen beef, has also become an important source of supply for "chilled" beef.

The prices realised, however, by Argentine beef remain considerably lower than those obtained by the fresh beef from the United States, and the total value of fresh beef imported from the United States in 1905 was returned as £4,834,611, as against £3,751,780 for fresh beef from the Argentine Republic. It is important, however, to realise the rapid advance which the Argentine Republic has made, that its import of fresh beef into the United Kingdom has risen from 50,095 cwts., in 1896, to 412,262 cwts. in 1900, and to 2,580,182 cwts. in 1905, and that of this amount it is estimated that approximately 650,000 cwts. were "chilled," the remainder being "frozen" beef.

Regarding the relative quantities of "frozen" and "chilled" beef, the total imports of "chilled" beef are estimated by Messrs. Weddel to amount to 2,890,997 cwts., in 1905, whereas the "frozen" beef imports are estimated at 2,131,424 cwts. The "frozen" beef imports greatly increased in 1904 and 1905. In the case of "chilled" beef the increase in recent years has been much less marked owing to the decline in shipments from the United States.

The prices of the various qualities of fresh beef vary widely from an average of close on 7d. per lb. in Prices of Beef. first quality home-grown to  $2\frac{3}{4}d$ . for frozen fore-quarters. Home-grown prime beef maintains a clear lead. Birkenhead and Deptford

killed sides follow closely on the average home-grown beef. American "chilled" beef, taking hind-quarters and fore-quarters together, realises about 5s. less per cwt. Argentine "chilled" beef, a considerably lower price; while last of all are the frozen beef supplies. According to information kindly afforded by the Board of Agriculture and Fisheries, in 1905 first-quality British averaged 51s. 6d. per cwt., and second-quality 47s. per cwt.; United States and Canadian port-killed cattle, 48s. per cwt.; American chilled hind-quarters, 52s. 6d. per cwt., and "chilled" fore-quarters 33s. 6d. per cwt.; Argentine "chilled" hind-quarters 39s. per cwt., and fore-quarters 27s. 6d. per cwt. For Argentine "frozen" beef the average price for the year of hind-quarters was 31s., and fore-quarters 25s.

There was a general fall in beef prices in 1905 as compared with 1904. Looked at over a period of ten years, 1896-1905, prices present fluctuations rather than a fall, but prices were very low in 1896, and while in subsequent years they rose, reaching a high level in 1902, they have again fallen to the former low level. On the whole, however, the prices of the highest qualities of beef have not fluctuated or fallen to the same extent as the lower grades, and this tendency is likely to be as plainly marked in the future. The best qualities of home-grown and home-killed beef have advantages over port-killed beef, and still more over the chilled and frozen imports.

It has been pointed out that there has been no marked increase

## Advantages of home grown beef.

in recent years in the number of cattle imported for slaughter. A great increase, on the other hand, has taken place in the case of dead meat, and especially of frozen beef

and mutton. But fresh killed beef of first quality will always obtain the highest prices. Methods of preserving fresh beef have greatly advanced, but the drawbacks have so far not been altogether overcome. In the case of frozen beef it is frequently noticed that when this is removed from cold storage some of the juices escape, and that if allowed to stand they jelly, thus showing that in the liquid which drains away from the beef there are contained some of the albumenoids, which are of value as the more soluble and more digestible proteids. Again, when frozen meat is removed from cold storage it decomposes more rapidly than fresh meat. It will also be remembered that while, under the most perfect management and marketing, these defects will be minimised, meat

is an article which in the retailing has to be widely distributed.

Inspection of imported meat.

These are natural advantages which will continue to place fresh killed beef at a premium in the market. But there is also a further circumstance, namely, that the inspection of

meat can be better controlled in the case of what is fresh killed than is possible in the case of meat killed at distant centres under foreign regulations, and subjected to chilling or freezing. Foreign inspection and guarantees cannot be so satisfactory to the consumer as the evidence of a stringent home inspection. How stringent this home inspection is, especially at the larger markets, regarding home-killed animals, is well known. Thus in the case of one city where inquiries were recently made, a quarter of beef would be wholly or partially condemned as unfit for food owing to the presence of one or more tubercles on the pleura, and if a tubercle is detected in the carcase of a pig the whole of the animal is condemned. On the other hand, dead meat as imported is subject to no such systematic inspection. Even if it were regularly inspected it would be difficult, if not impossible, to say whether tubercles had been removed from an apparently healthy quarter of chilled or frozen beef. The case is still more serious in the matter of frozen boneless beef, the boxes of such beef consisting of pieces cut from various parts of the carcase.

But summing up the whole situation, what stands out as of greatest importance is the fact that the home grower must endeavour to produce the best quality, and that he must be enabled to market this in the best condition. For the first quality of beef the demand and the prices are likely to remain good. It is the second and third qualities which are specially in danger from the growing imports of chilled and frozen meats.

There is, however, one other, and that a wider consideration, which should not be overlooked by Irish farmers. The imports of foreign and colonial dead meat have been increasing more rapidly than any other agricultural import which competes with the home product. This may be best seen from the following statement showing the increase in the consumption per head of population in the United Kingdom of foreign and colonial grain foods, dead meat, butter and eggs.

TABLE showing the Proportional Quantities, per head of the Population of the undermentioned kinds of Agricultural Food Products, Imported into the United Kingdom during the Years 1885, 1890, 1895, 1900, 1905.

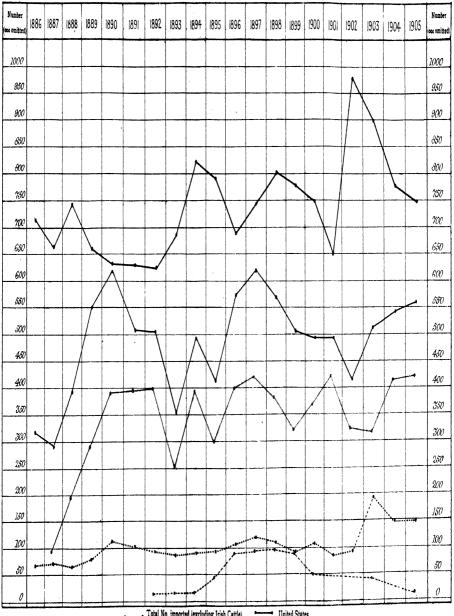
		(Not inclu	Dead iding Rabbi	Meat. its, Poultry,	or Game.)		
Years.	Corn, Grain, Meal and Flour.	Fresh Beef, Mut- ton, and Pork.	Bacon and Hams,	Other meat, Fresh and Preserved by salting or otherwise.	Total of Dead Meat.	Rutter and Margarine.	Eggs.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	No.
1885,	447	4.8	12.6	3'4	20.8	7.5	28
1890,	465	10-6	14.9	4.1	29-6	9-3	33
1895,	518	14-5	15.3	5.4	34.2	10.7	39
1900,	516	224	20.3	4.8	47.5	11.7	49
1905,	509	24.2	17.7	4.8	46.7	13-6	52

From this table it will be noted that the increase in foreign and colonial supplies has been greatest in the case of dead meat, and further, that among the various classes of meat the increase in imports has been greatest in the case of fresh meat. These facts are the more significant when it is remembered that in recent years the prices of the chief grains have shown a tendency to advance, and that the decline in the prices of other agricultural produce has not been so marked in recent years as in the case of beef.

All this points to the fact that Ireland must depend on a diversified agriculture, and that she must produce fresh supplies of the best quality in every line.

The accompanying series of diagrams illustrates several of the developments noted in the foregoing pages.

Diagram I.—Showing the variations in the numbers of CATTLE imported into the United Kingdom from certain Foreign Countries, and also in the numbers of the CATTLE imported into Great Britain from Ireland, during the years 1886-1905.



Total No. imported (excluding Irish Cattle)

" " from Canada, " Argentine Republic,

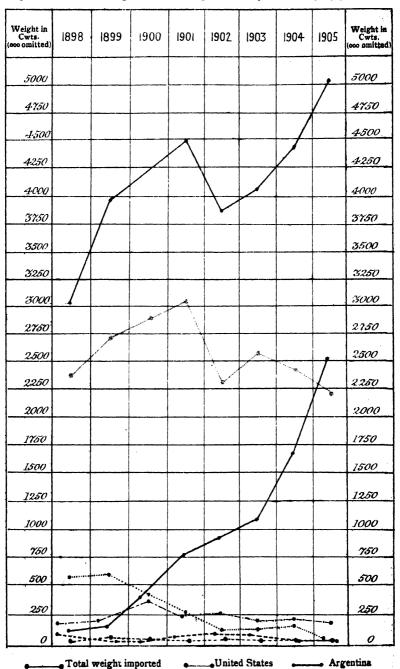
Argentine Republic,

" ,, Imported into Great Britain from Ireland,

NOTE.—The figures for the following Countries and years are not available:— United States, 1896, 1898, 1891.

Argentine Republic, 1896-1891 (inclusive); 1901 2; 1904.

Diagram II Showing the variations in the weights of BEEF (Fresh) imported into the United Kingdom from certain Foreign Countries during each of the years from 1808-1905 inclusive.



-----Canada

...... New Zealand

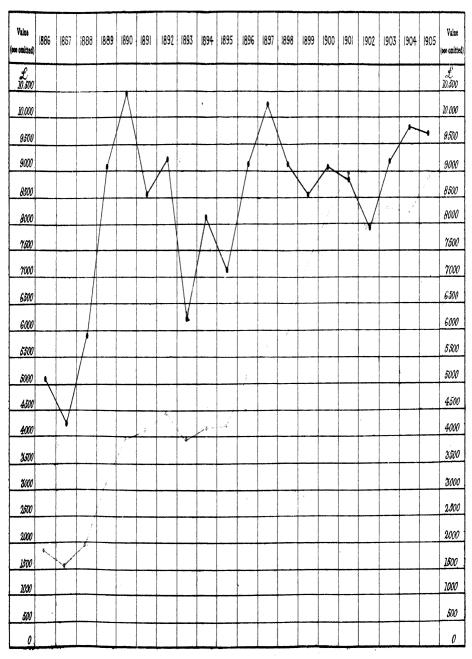
Europe

• ..... Australia

Diagram III.—Showing the variations in the Average Prices of BRITISH CATTLE First Quality per 8 lbs (sinking the offat) at the Metropolitan Cattle Market, London, during the years 1886-1905.

Averuge Price	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	1905	Average Price
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4/10					_/				-								$\bigwedge$				4/10
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4/1									\									7	\	7	4/1
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4/5		V									$\bigvee$										4/5
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Diagram IV.-Showing the variations in the Values of CATTLE and FRESH BEEF imported into the United Kingdom during the years 1886-1905.



◆ Value of Cattle imported

Diagram V.—Showing the variations in the numbers of FAT and STORE CATTLE exported from Ireland to Great Britain during the years 1886-1905 inclusive

Number (000 omitted)	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	. 1900	1901	1902	1903	1904	1905	Number (000 omitted)
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Diagram VI. - Showing the variations in the numbers of STORE CATTLE exported from Ireland to Great Britain during the fifty-two weeks of the year 1905.

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Diagram VII.—Showing the variations in the numbers of FAT CATTLE exported from Ireland to Great Britain during the fifty-two weeks of the year 1905.

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#### THE REPORT ON THE BUTTER TRADE.

Early in the year a Select Committee of the House of Commons was appointed to consider whether any and, if so, what further legislation might be required in order to secure the better conduct and control of the trade in Butter and Butter substitutes. The following were nominated members of the Select Committee:—

Mr. Dalziel, Sir Edwin Cornwall, Mr. Courthope, Mr. Lonsdalc, Mr. Steadman, Major M'Micking, Mr. Scott, Mr. James Stuart, Mr. Osmond Williams, Sir Edward Strachey, Mr. Warner, Viscount Morpeth, Mr. Hicks Beach, Mr. Flynn, and Mr. Lundon.

The Report of the Committee has just been published (House of Commons White Paper, No. 245—1906).

The Committee make a number of important recommendations for the protection of the consumer, chiefly in relation to powers of inspection, and registration, the fixing of standards, and the prevention of misdescription. The recommendations are set forth as follows:—

- (1.) That Inspectors of the Board of Agriculture and Fisheries and the Department of Agriculture and Technical Recommendations.

  Instruction for Ireland, should have power to enter any premises where they have reasonable grounds for believing that butter is made, blended, re-worked, treated by any process, adulterated, or stored.
- (2.) That premises where butter is blended, or re-worked, or treated by any process, or where abnormal butter is habitually produced, shall be registered with the local authority of the district as a butter factory.
- (3.) That no fat, other than butter fat, and no vegetable or other oils, nor any substance capable of being used as an adulterant of butter should be brought into or stored or allowed to be in any registered butter factory.
- (4.) That no substance be added to butter whereby the percentage of moisture in the butter is increased.
- (5.) That the addition to butter at any stage of the process of manufacture of any fat not derived from milk be expressly and directly prohibited.
- (6.) That margarine, when sold by retail, should be handed to the purchaser in a wrapper, on which the word "Margarine" shall be printed in black solid capital letters, not less than ½-inch square, and if more than one wrapper is applied to the margarine, the word "Margarine" shall be printed as above on the inner wrapper; that no fancy name or description should be permitted which refers to butter or anything connected with the dairy industry; that the outside wrapper, as

well as the inside wrapper, should contain nothing but the word "Margarine" in type as aforesaid, and if any fancy name is printed on any other wrapper, the word "Margarine" should be suffixed or affixed to the fancy name in letters of the same size, colour and type as those in which the fancy name is printed.

- (7.) That no margarine made in any margarine factory shall, when the process of manufacture is complete, contain more than 16 per cent. of water, and no margarine shall be imported containing more than 16 per cent. of moisture.
- (8.) That premises where margarine is re-worked or submitted to any process shall be registered as margarine factories.
- (9.) That Sub-section 3 of Section 20 of the Sale of Food and Drugs Act, 1899, be amended so as to provide that a warranty or invoice given by a person resident outside the United Kingdom shall not be available as a defence to any proceedings under the Sale of Food and Drugs Acts.
  - (10.) That penalties for the importation of adulterated butter should be proportionate to the magnitude of the con-Adulteration and the signment.

use of Preservatives. (11.) That all practicable steps should be taken to bring about international agreements as to the prevention of adulteration.

- (12.) That Section 4 of the Sale of Food and Drugs Act, 1899, should be amended so as to give the Board of Agriculture and Fisheries and the Department of Agriculture and Technical Instruction for Ireland power to fix standards for curd, and to give the Local Government Board power to fix standards for preservatives.
- (13.) That the Department of Agriculture and Technical Instruction for Ireland should have power to take proceedings under the Merchandise Marks Act.
  - (14.) That nothing shall be sold under the name of butter which contains more than 16 per cent, of moisture.

Limits of Moisture, (15.) That substances other than butter (not being margarine) containing butter fat should be sold, with a limit of 24 per cent. of moisture,

under a name approved by the Board of Agriculture and Fisheries; provided that such name should not be calculated to prejudice the sale of the article.

(16.) That such substances when sold by retail should be delivered to the purchaser in a wrapper, approved by the Board of Agriculture and Fisheries, containing a description of the nature, substance, and quality of the article; and as far as possible under the same conditions as apply to the sale of margarine.

- (17.) That the provisions of the Margarine Act of 1887, as amended by the Sale of Food and Drugs Act, 1899, should apply to all such substances.
- (18.) Inspectors acting under the special direction of the local authority should have power to enter butter factories, to inspect any process, and to take samples.
- (19.) That butter having been treated by any process shall not be allowed to be replaced in the original packages.

The essence of the report is embodied in these recommendations, but the Committee in detailing the grounds for some of their recommendations, refer to some phases of the butter trade that have been the subject of very general public attention. With regard to blended or

Butter Blending.

factory butter, they say that blending different sorts of butter is in their opinion a legitimate industry, subject of course to the prescribed

standard of purity and freedom from moisture being observed.

As regards the blending of milk with butter, they say "Your Committee think it would not be desirable to prohibit the manufacture or sale

"Milk-Blended Butter." of the substance known as Milk-Blended Butter, as it appears that this substance meets the wants, or suits the tastes of a certain section of the community; but they consider that it is not

butter: that it and other substances (not being margarine) containing butter fat, should only be allowed to be manufactured for sale under a special name and regulations approved by the Board of Agriculture and Fisheries; and that when sold by retail it should be delivered to the purchaser in a wrapper, also approved by the Board of Agriculture and Fisheries. It would be necessary that factories where this mixture is made, and the premises of wholesale dealers who deal in it, should be registered, and that books should be kept on these factories and premises by which consignments of this mixture could be traced to the retailer."

A number of witnesses expressed the opinion that no special exemp-

Irish Salt Firkin Butter. tion with regard to the limits of moisture in salt firkin butter manufactured by Irish farmers is desirable. The Committee concur in this view. They think that the existing law is

sufficient to prevent the manufacture by Irish farmers of salt firkin butter containing an unreasonable or fraudulent amount of moisture. They do not, therefore, so far as this kind of butter is concerned, recommend any further legislation.

#### THE SURPRISE BUTTER COMPETITIONS.

As the Surprise Butter Competitions which the Department hold annually have entered on their fourth year, it may be of interest to set forth briefly an account of their object; the extent to which they are of advantage to the Proprietors and Managers of creameries; the manner in which they have been conducted; and the results attained.

The purpose of the competitions is explained in the following extract

### Object of the Competitions.

from the Regulations which appear on p. 13 of the Department's Scheme for "Improvement in the Management of Creameries."

"The object of these competitions is to induce creamery managers and others engaged in butter-making to give increased attention to every detail in the making and packing of butter, and particularly to cleanliness in every stage of the work. The reputation of Irish butter must depend on the degree in which these two essentials, viz., cleanliness and attention to details, are possessed by Irish Butter-makers. But unless interest in the work can be increased and sustained, and unless those engaged in the industry bring into the work a certain amount of enthusiasm, accompanied by a desire and a determination to excel, the qualities which mark the successful butter-maker will not be perpetuated, and the possibilities of Ireland as a butter producer cannot be realised to the full. nately, butter-making is an occupation which becomes engrossingly interesting to those who have studied the numerous scientific problems which it presents to the thinking mind. The courses of instruction for creamery managers have been instrumental in arousing interest in the scientific side of dairving, and it is hoped that these competitions may serve the further useful purpose of stimulating many creamery managers to greater sustained practical efficiency. They certainly should set up a standard of comparison by means of which butter-makers will be able to measure their progress towards perfection."

In addition to the general educational advantages of the competitions

### Advantages to the Proprietors and Managers.

as set forth above, they afford to the creamery proprietors and managers who participate an opportunity of ascertaining, individually, how their produce compares with that of the other

competitors, of obtaining the opinions of the best commercial judges on the quality of their exhibits, of finding out whether any improvements are desirable in marketing, of hearing, perhaps, of some fault of which they had not been aware previously, and about which they may have received no complaints so long as the price of their butter suited their customers. Subsequently, through the services of the Department's

Inspectors and Instructors, they can procure information as to mean's or methods of remedying any defects pointed out at the competitions, thus being enabled to produce an article which they can market to better advantage.

The butter exhibited is called up for the competitions by telegrams despatched by the Department on the morning Manner of Conducting of the day on which the exhibits must be forthe Competitions. warded. The competitors are unaware of the dates on which the telegrams are to be des-They may receive a telegram on any date during the season. The constant daily attention which a competitor must accordingly give to his work is one of the principal advantages which accrue from the system of surprise competitions. In view of the system of notifying creameries by telegram no special preparation can be made and the butter exhibited represents what is shipped to the British market, and not a parcel of butter specially prepared from selected milk or from cream ripened and churned under special conditions. It is, therefore, the commercial butter that is judged, not what is so often called "Show Butter."

In order that the butter may be tested on a strictly commercial basis it is stored, on its receipt in Dublin, under ordinary conditions for a period of 6 to 10 days. At the expiration of this period the butter is examined and judged. Any faults latent in the butter, due to defects in the methods of manufacture or the acceptance of bad raw material, will have, generally, developed during the waiting period, and the judges see the butter as it would reach the consumer, not as it leaves the creamery.

The method of judging hitherto adopted is as follows:—four judges, of whom one is always an Irish buyer resident Judging. in Ireland, first examine and score the butter for flavour, texture and colour. There is no discussion between the judges during this scoring, so that the unbiassed opinion of each individual judge is obtained. The butter is then turned out of the packages and the judges jointly score the samples for packing and finish.

As the greater part of Irish butter is sold in Great Britain, three of the judges are chosen from important butter distributing centres, being selected to represent the buyers whom it should be the object of the proprietors and managers of creameries to please. The judges represent different districts, so that the butter is not secred from a local

point of view. Colour being one of the characteristics of butter which may render it suitable or unsuitable for a particular market, the judges are requested to eliminate the question of depth of colour. They deduct points only when the colour is dull, muddy, mottled, or streaky, so that an exhibitor making a pale butter suitable for a North of England market is not handicapped by the butter being submitted to a judge from a district where a deeper colour is in request

The following is the scale of points adopted as a basis in judging:-

Flavour,	•				60	points.
Texture,					25	,,
Colour,				•	5	,,
Packing ar	nd fini	ish,	•	•	10	"
					100	

The full marks represent what the judges consider the best butter, from any source whatever, arriving in the markets of Great Britain. No exhibit is entitled to full marks unless, in the opinion of each of the judges, it equals this butter in every respect. In the scoring, deductions are made for a defect under any heading in proportion as the butter suffers in monetary value from the defect. Any reduction of the commercial value of a butter is thus expressed as nearly as possible in the marks. The standard is high, but it is what all should aim at.

In addition to the marks awarded notes are frequently added explaining, where possible, why a butter is "scored down" under any particular head, e.g., flavour, texture, &c.

It may not be out of place here to acknowledge on behalf of the creameries and the Department the thanks due to those gentlemen, Irish, Scotch and English, who have assisted at the competitions by giving their services as judges.

Since 1903, the Department have invited a number of Creamery
Managers to attend at various competitions,
Presence of Creamery their expenses being paid by the Department.
Managers at the They were by this means afforded an opportunity of discussing with the judges, on the day of the competition, the defects and improvements in the exhibits generally. Next day they were permitted to examine personally their own exhibits, see their scores, and compare them with



View of section of Hall used for Surprise Butter Competitions, showing one of the Department's Inspectors explaining to Creamery Managers the defects in a sample of Butter.



the other samples, under the direction of one of the Department's Inspectors, by whom the defects noticed in the exhibits and the steps to be taken to bring about an improvement were explained in detail.

The managers have frequently expressed their high appreciation of the aid such visits have afforded them in their work,

Results attained. comparison between the packing and finish of the samples sent up during the first year of these competitions, and the packing and finish of those entered for the competitions at the present day. The importance of being able to control the temperature at which churning and working of the butter should be carried out has been better realised, with the result that the texture of the butters shows decided improvement. While at all times Ireland has produced some butters unequalled in flavour by those produced in any other part of the world, there is room for improvement in the average quality, and it is satisfactory to note that this has to some extent taken place, and that there are now fewer lots of poorly flavoured butter noticed at the competitions.

Such are the spinions of the judges—all men of wide experience—who have acted at competitions during the past three years.

While the competitions show that considerable progress has taken place, efforts towards further improvement on the part of the creamery proprietors and managers must on no account be relaxed. If creamery proprietors and managers will fully avail themselves of the advantages offered by these and other similar opportunities, there is no reason why Irish butter should not be raised to a position second to none on the markets.

In order to assist in refuting the impression prevailing amongst some few merchants and grocers that Irish creamery butter contains a high percentage of water, a table giving the amount of water found in the samples awarded marks qualifying them for prizes during the years 1903, 1904, and 1905, and tables showing the amount of water and of salt in each of the samples sent to the first Surprise Butter Competition of this year are appended.

RESULTS OF ANALYSIS OF 311 Samples of Irish Creamery Butter which were awarded marks qualifying them for prizes during the years 1903, 1904, 1905.

Percentage of Water,	No. of Samples.
9·0 9·9	2
10·010·9	8
11·011·9	45
12·012·9	110
13·013·9	93
14·014·9	42
15·015·9	12
16·016·9	3
17·017·9	1

Thus out of 311 samples only 4 exceeded the 16 per cent. limit and three of these occurred in the first year.

RESULTS OF ANALYSIS of 119 SAMPLES of Irish Creamery Butter, being exhibits at the First Surprise Butter Competition, 1906.

WATER.

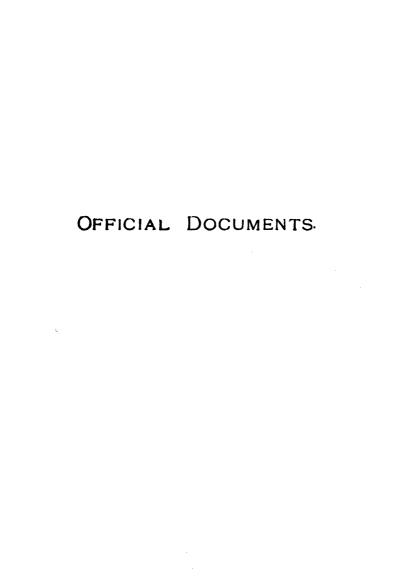
Percentage of Water.	No. of Samples.	Percentage of Total Number of Samples.
10·01—11·00	5 -	4·2
11·01—12·00	13 -	10·9
12·01—13·00	41	84·4
13·01—14·00	28	23·5
14·01—15·00	18	15·1
15·01—16·00	14	11·8

Considering that the samples were called up during a period of hot weather when the cooling facilities at a creamery would be strained to their utmost these results are eminently satisfactory.

SALT.

Percentage of Salt.	No. of Samples,
4—1·0°/ <sub>o</sub> 1·01—2·0°/ <sub>o</sub> 2·01—2·7°/ <sub>o</sub>	20 88 11
	119

It will be observed that the average of the above figures falls considerably below the limit of 3 per cent. fixed by the conditions of the competitions, and it is therefore evident that Irish Creameries are producing a lightly salted butter suitable for immediate consumption.



#### I.-ADMINISTRATIVE.

# DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

#### 1906.

#### I.-COUNCIL OF AGRICULTURE.

[104 Members, including the President and Vice-President.] Arranged in Alphabetical Order according to Provinces.

#### LEINSTER (36 Members.)

Name.	Address.
Anderson, Robert A.,	22, Lincoln-place, Dublin.
Brenan, Gerald J., J.P., Briscoe, Algernon T. F., J.P.,	Eden Hall, Ballyragget, Co. Kilkenny. Curristown House, Killucan, Co. West- meath.
Brown, Stephen J., J.P., Bryan, Captain Loftus A., J.P., D.L.,	Ard Caien, Naas, Co. Kildare. Borrmount Manor, Enniscorthy, Co. Wexford.
Byrne, Thomas J., J.P.,	Rossmakea, Dundalk, Co. Louth.
Carew, Thomas M.,	Kildangan, Kinnegad, Co. Westmeath. 115, Thomas-street, Dublin. Coolmore House, Thomastown, Co. Kil-
Corbet, William M.,	kenny. Killeigh, Tullamore, King's County.
Delany, Thomas W	Longford. Roskeen, Killeigh, Tullamore, King's County.
Donohoe, James, J.P.,	Abbey House, Enniscorthy, Co. Wexford.
Downes, Robert, J.P.,	Russellstown, Mullingar, Co. Westmeath.
Everard, Colonel Nugent T., D.l., .	Randlestown, Navan, Co. Meath.
Field, William, M.P., Finlay, Rev. T. A., M.A., F.R.U.I.,	Blackrock, Co. Dublin. University College, Dublin.
Garvey, Toler R., J.P., Goodbody, Marcus, J.P.,	Thornvale, Moneygall, King's County. Talbot Lodge, Grove-avenue, Black-
Hanlon, Patrick	rock, Co. Dublin. Grangeforth, Carlow. Brownstown, Athy, Co. Kildare.
Kavanagh, Walter M'M., J.P., D.L., . Kennedy, Patrick J., J.P., King, Nicholas B.,	Borris House, Borris, Co. Carlow. Rathcore House, Enfield, Co. Meatn. Knockdillon, Knockbridge, Dundalk, Co. Louth.

#### COUNCIL OF AGRICULTURE.

#### LEINSTER-continued.

Name.	Address,	
M'Carthy, James, MacMahon, James, J.P., Mayo, The Right Hon. the Earl of, K.P., P.C., D.L., Mechan, Patrick A., J.P., M.P., Molloy, John J., J.P., Murphy, George F., J.P.,	Newfoundwell, Drogheda, Co. Louth. Ballyroan, Abbeyleix, Queen's County. Palmerstown House, Straffan, Co. Kildare. Maryborough, Queen's County. 55, Harcourt-street, Dublin. The Grange, Dunsany, Co. Meath.	
O'Neill, Patrick J., J.P.,	Kinsealy House, Malahide, Co. Dublin.	
Peacocke, Charles H., J.P.	Belmont, Wexford.	
Reynolds, Henry, Ronaldson, William R.,	Ballinalee, Edgeworthstown, Co. Long- ford. Barn Hall, Leixlip, Co. Kildare.	
Thompson, R. Norman, M.B., J.P.,	Kindlestown, Delgany, Co. Wicklow.	
Wilson, James Mackay, J.P.,	Garvagh, Edgeworthstown, Co. Longford.	

#### ULSTER (27 Members).

Name.	Address.  Ardara, Comber, Co. Down.  Castle Archdale, Irvinestown, Co. Fermanagh.	
Andrews, The Right Hon.Thomas, P.C., D.L., Archdale, Edward, J.P., D.L.,		
Barbour, Frank,	Malt House, Farm Stables, Welles- bourne, Warwick. The Bush, Antrim. The Cairn, Aghalee, Co. Antrim.	
Campbell, Rev. E. F., M.A., . Clark, Alexander L., J.P., .	Killyman Rectory, Moy, Co. Tyrone. Moyola Lodge, Castledawson, Co. Lon- donderry.	
Gilliland, George Knox, J.P., D.L., .	Brook Hall, Londonderry.	
Huston, Robert T., M.R.C.V.S.,	The Mall, Armagh.	
Jordan, Jeremiah, M.P.,	Enniskillen, Co. Fermanagh.	

#### COUNCIL OF AGRICULTURE.

#### ULSTER-continued.

O DO I DIE CONTINUATE			
Name.	Address.		
Keenan, John, J.P.,	Leitrim, Castleda wson, Co. Londonderry Bellaghey, Co. Armagh.		
Law, Hugh A., J.P., M.P.,  Lough, Arthur S., J.P., Lynch, Francis J.,  M'Cance, John S. F., J.P., M'Glynn, The Rt. Rev. Monsignor, P.P., V.G., M'Kenna, T. P., Montgomery, H. de F., D.L.,  Moore, James Stewart, J.P., D.L., Murnaghan, George, M.P.,	Marble Hill, Ballymore, Letterkenny, Co. Donegal. Drom Mullac, Killeshandra, Co. Cavan. Ballyjamesduff, Co. Cavan.  Woodbourne, Dunmurry, Co. Antrim. Parochial House, Stranorlar, Co. Donegal. Mullagh, Co. Cavan. Blessingbourne, Fivemiletown, Co. Tyrone. Ballydivity, Dervock, Co. Antrim. Lisanelly House, Omagh, Co. Tyrone.		
O'Kieran, Rev. Laurence, C.C.,	Drumquasat, Carrickmacross, Co. Monaghan		
Reade, Robert H. S., J.P., D.L.,	Wilmont, Dunmurry, Co. Antrim		
Sharman-Crawford, Colonel R. G., J.P., D.L.,	Crawfordsburn, Co. Down.		
Smyth, William, J.P., Stoney, Captain T. Butler, J.P., D.L.,	Brookfield, Banbridge, Co. Down. Oakfield Park, Raphoe, Co. Donegal		
Toal, Thomas, J.P.,	Smithboro', Monaghan.		

#### MUNSTER (24 Members).

Name		Address.	
Barter, Richard, J.P., Byrne, James, J.P.,		St. Ann's Hill, Cork. Wallstown Castle, Castletownroche, Co. Cork.	
Coghlan, Captain William C.,	J.P., .	Dromina, Woodstown P. O., Co. Waterford.	
Connery, Maurice, M.D., J.P., Corcoran, Thomas, J.P., Cummins, Edmond, J.P.,	•	Kilfinane, Co. Limerick. Honeymount, Roscrea, Co Tipperary. Brookhill, Fethard, Co. Tipperary.	
Duggan, Thomas, .	• •	The Castle, Two-Mile-Borris, Thurles-Co. Tipperary.	
Hogan, Patrick J., J.P.,		Coolreagh, Bodyke, Co. Clare.	
Kelly, Most Rev. Denis, D.1 Bishop of Ross.	D., Lord	Bishop's House, Skibbereen, Co. Cork.	

#### COUNCIL OF AGRICULTURE.

#### MUNSTER-continued.

Name.	Address.
M'Donald, William,	. Laharan, Minane Bridge, Carrigaline
Manning, Patrick S.,	. Mayladstown, Carrick-on-Suir, Co
Mescal, Michael, J.P., Monteagle. The Right Hon. Lord, K. D.L.	Tipperary. Dromelihy, Cooraclare, Co. Clare. A.P., Mount Trenchard, Foynes, Co. Limerick
Mulially, Patrick F., J.P.,	. Glenwood Cottage, Mullinahone, Co Tipperary.
Nolan, Michael J., J.P.,	Moyvane House, Newtownsandes, Co
Nugent, Edmond, J.P., .	Ballymacarbery, Clonmel, Co. Tipperary
O'Callaghan, Cornelius, O'Gorman, David Leo, O'Gorman, George,	. Altamount House, Millstreet, Co. Cork. Janeville, Fermoy, Co. Cork. Kilkneedan, Farranfore, Co. Kercy
Power, Thomas,	. Dungarvan, Co. Waterford.
Ryan, Hugh P.,	Roskeen, Thurles, Co. Tipperary. Killinure, Brittas, Co. Limerick.
Sheehy, Timothy,	. Market-street, Skibbereen, Co. Cork.
Trench, George F., J.P.,	. Abbeylands, Ardfert, Co. Kerry

#### CONNAUGHT (15 Members).

Name.	Address.	
Clonbrock, The Right Hon. Lord, K.P., P.C., H.M.L. Conroy, John C., (Solr.), Costello, P. J.,  Digges, Rev. Joseph G., M.A.,  Flynn, Patrick, J.P.,  Galvin, John, Gore-Booth, Sir Josslyn, Bart., D.L., Griffin, Thomas G.,  MacGuire, James P., M'Hugh, P. A., M.P., M'Loughlin, Rev. P., P.P., Meehan, Rev. Joseph, C.C., Morrin, Daniel,  Nolan, Colonel John P., J.P.,	Clonbrock, Ahascragh, Co. Galway.  St. Francis street, Galway. Cloghansmore House, Cloghans Hill, Tuam, Co. Galway. Clooncahir, Lough Rynn R.S.O., Co. Leitrim. Carrick-on-Shannon, Co. Leitrim.  Mount Talbot, Roscommon. Lissadell, Sligo. Gurteen, Ballinasloe, Co. Galway Rooskey, Dromod, Co. Leitrim. Sligo. Glenade, Manorhamilton, Co. Leitrim. Creevelea, Drumkeeran, Co. Leitrim. Foxford, Co. Mayo.  Ballinderry, Tuam, Co. Galway	
O'Dowd, John, M.P.,	Bunnanadden, Co. Sligo.	

#### II.--AGRICULTURAL BOARD.

(14 Members.\*)

Name.	Address.	By whom appointed.
Clark, Alexander L., J.P., .	Moyola Lodge, Castle- dawson, Co. Londonderry.	The Department.
Daly, Very Rev. James, D.D.	adereen, Co. Mayo.	Connaught Provincial Com- mittee.
Downes, Robert, J.P., .	Russellstown, Mullingar,	Leinster Provincial Com- mittee.
Everard, Col. Nugent T., D.L.	Randlestown, Navan, Co. Meath.	The Department.
Gore-Booth, Sir Josslyn, Bart., D.L.	Lissadell, Sligo,	The Department.
Healy, His Grace The Most Rev. John, D.D., Lord Archbishop of Tuam	St. Jarlath's, Tuam, Co. Galway.	Connaught Provincial Committee.
Kelly, Most Rev. Denis, D.D., Lord Bishop of Ross.	Bishop's House, Skibbereen, Co. Cork.	Munster Provincial Com- mittee.
Lough, Arthur S., J.P., .	Drom Mullac, Killeshandra, Co. Cavan.	Ulster Provincial Com- mittee.
Monteagle, The Right Hon. Lord, K.P., D.L.	Mount Trenchard, Foynes, Co. Limerick.	The Department.
Montgomery, H. de F., D.L.	Blessingbourne, Fivemile- town, Co. Tyrone.	Ulster Provincial Com- mittee.
Mullally, Patrick F., J.P.,	Glenwood Cottage, Mullinahone, Co. Tipperary.	Munster Provincial Com- mittee.
O'Neill, Patrick J., J.P., .	Kinsealy House, Malahide, Co. Dublin.	Leinster Provincial Cornmittee.

#### III.—BOARD OF TECHNICAL INSTRUCTION.

(23 Members.\*)

Name.	Address.	By whom appointed.			
Barbour, Frank, Clancy, Most Rev. John, D.D., Lord Bishop of	Malt House, Farm Stables, Wellesbourne, Warwick. St. Mary's, Sligo,	Ulster Provincial Com- mittee. Connaught Provincial Com- mittee.			
Elphin. Crozier, James, J.P., V.S., Dunn, Christopher J., J.P.,	26 Montpelier Hill, Dublin. 1 Mount Verdon-terrace.	Dublin County Borough Council. The Department.  Joint Committee of Councils of the Co. Dublin			
Edmondson, Thomas, J.P.,	Wellington-road, Cork.				
Finlay, Rev. T. A., M.A., F.R.U.I. Goff, Sir William G. Davis, Bart., J.P., D.L.	University College, St. Stephen's-green, Dublin. Glenville, Waterford,	Urban Districts. Leinster Provincial Committee. Waterford County Borough Council.			

<sup>\*</sup> By section 24 (2) of the Agriculture and Technical Instruction (Ireland) Act, 1899, the President and Vice-President of the Department are ex-officio Members of the Board.

#### BOARD OF TECHNICAL INSTRUCTION.

Name.	Address.	By whom appointed.			
Harrington, Timothy C.,	70, Harcourt - street,	Dublin County Borough			
Henderson, Sir James, A.M., D.L.	Oakley House, Windsor- park, Belfast.	The Department.			
Joly, John, B.A.I., Sc.D., F.R.S.	Somerset, Temple-road, Rathmines, Co. Dublin.	The Department.			
Joyce, Alderman Michael, M.P., Mayor of Limerick.	Limerick,	Limerick County Borough Council.			
Lally, Very Rev. P. J., P.P.,	St. Joseph's, Galway, .	The Department.			
Lyon, Abraham,	Altona House, Howth- road, Clontarf, Dublin	Dublin County Borough Council.			
Macartney, William, .	Thornview, Clifton Park, Belfast.	Belfast County Borough Council.			
M'Learn, Sir William, J.P.,	Carrickmore House, Lon- donderry.	Londonderry County Bo- rough Council.			
Magee, Patrick Jo oph, .	49, Victoria-street, Bel- fast.	Belfast County Borough Council.			
Molloy, William R. J., J.P., M.R.I.A.	78. Kenilworth - square, Rathgar, Co. Dublin.	Commissioners of National Education.			
Power, Thomas,	Dungarvan, Co. Water- ford,	Munster Provincial Com- mittee.			
Sisk, Richard,	126, Evergreen-road, Cork,				
Starkie, William J. M., M.A., Litt D.	Tyrone House, Marlbo- rough-street, Dublin.	Intermediate Education Board.			
Taylor, Alexander, .	99, Donegall-street, Bel- fast.	Belfast County Borough Council.			

# IV.—CONSULTATIVE COMMITTEE OF EDUCATION. (5 Members.)

Name.	Address.	By whom appointed.			
The Right Hon. Sir Horace Plunkett, P.C., K.C. V.O., F.R.S., Vice-President of the Department.	Department of Agricul- ture and Technical In- struction, Dublin.	Ex-officio.			
William J. M. Starkie, M.A., Litt.D.	Tyrone House, Marlbo- rough-street, Dublin.	Commissioners of Nation Education.			
Rev. T. A. Finlay, M.A., F.R.U.I.	University College, St. Stephen's Green, Dublin.	Intermediate Education Board.			
William R. J. Molloy, J.P., M.R.LA.	78, Kenilworth-square, Rathgar, Co. Dublin.	Board of Technical In- struction.			
T. P. Gill.	Department of Agricul- ture and Technical In- etruction, Dublin.	Agricultural Board.			

#### II.—AGRICULTURE.

FORM A. 180 (a.)

# DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

# THE ALBERT AGRICULTURAL COLLEGE, GLASNEVIN, DUBLIN.

#### SESSION, 1906-7.

The buildings at this College have recently been remodelled and equipped in the most modern manner. The farm, gardens, and laboratories provide every facility for a thorough course in technical agriculture, combined with such instruction in chemistry, physics, botany, and veterinary science as is necessary to the proper understanding of the principles underlying the most approved farm practice. Manual instruction in wood and iron is also provided in suitable workshops.

The students are required to take part in the work of the fields and

of the farmyard.

The Session for the year 1906-7 will commence on the 9th October, 1906, and terminate on the 6th September, 1907. There will be two short intervals, one at Christmas and one at Easter or at Whitsuntide, during which the students may return to their homes.

Students must be not less than 17 years of age, nor more than 27 years of age, on the 1st September, 1906. Admission to the College is conditional on passing the entrance examination and furnishing evidence

of good health and character.

#### ENTRANCE EXAMINATION.

The entrance examination will be held on the 18th September, 1906, at four centres, situated respectively in each of the provinces. Each applicant for admission will be notified in due course of the centre at which he should attend for examination.

No expenses will be allowed to candidates in respect of their attendance at the examination.

The subjects included in the examination will be as follows:

- (1.) English, including Dictation and Composition.
- (2.) Arithmetic, including calculations requiring a thorough knowledge of Weights and Measures, Decimal and Vulgar Fractions, Percentages, and Interest.
- (3.) Mathematics.—The elements of Mensuration and Algebra to Simple Equations.

(4.) Practical Agriculture.—The questions on this subject will be framed with a view to testing the knowledge acquired by the candidates through practical experience of farm work. No text-book on agriculture is prescribed or recommended. The examination may be oral as well as written.

#### FEES.

The fees for tuition, board, residence, laundry, and ordinary medical attendance during the entire Session will be:—

For students whose parents or guardians derive	their	mean	ıs	
of living mainly from farming in Ireland,				£25
For students other than the foregoing, .	• .	•		£60

The fees are payable to the Principal in two instalments, viz., one-half on entrance and one-half on 1st March, 1907. In addition to the instalment of the fee payable on entrance each student must deposit with the Principal a sum of £2 to cover the cost of repairs to clothing, purchase of books and stationery. The unexpended balance, if any, of this deposit will be returned at the close of the Session.

#### SCHOLARSHIPS.

Twenty-five Scholarships, open only to candidates whose parents derive their means of livelihood mainly from farming in Ireland, will be awarded on the results of the entrance examination. The holder of a Scholarship will be exempt from payment of a fee, but he will be required to make the deposit of £2 to cover the cost of repairs to clething, &c.

Students who have already attended a Session at the Albert Agricultural College will not be eligible to compete for these Scholarships.

Note:—The provision of free places at future Sessions is under consideration, and the award of Scholarships may be discontinued after the 1906-7 Session.

Application for admission to the College must be made on the prescribed form, which may be obtained from --

THE DEPARTMENT OF AGRICULTURE AND
TECHNICAL INSTRUCTION FOR IRELAND,
UPPER MERRION-STREET, DUBLIN.

Last date for making applications, 7th September, 1906.

# DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

#### THE MUNSTER INSTITUTE, CORK.

The classes at the Institute are open to female students only. The course of training includes:—

1. The practice of dairy-work. The treatment of milk and the making of butter on a large and on a small scale with the most modern machinery and implements, as well as with the appliances generally used in farm dairies.

II. Instruction in the feeding and management of cows, calves and pigs; in the keeping of small gardens, and in the

manipulation and caring of bees.

III. Instruction in poultry-keeping. Breeds; their suitability for different purposes and different localities; housing, feeding and management; hatching and rearing of chickens; fattening, killing, plucking, trussing and preparation for market.

IV. Instruction in domestic work, embracing plain cookery, plain needlework and laundry work.

The fee for tuition, board and lodging during one session is £3 38., and is payable to the Superintendent of the Institute on entrance.

Four sessions, each of about eleven weeks duration, and commencing respectively, in January, March, July and October, are held in each year.

Intending students must be at least seventeen years of age on the date of their admission to the Institute. They are required to produce certificates of good health and character and to pass an examination in the elements of English and Arithmetic. This examination is held at the Institute at the opening of each session.

Students are eligible for admission to a second consecutive session, provided they attain the required standard at the examination at the conclusion of their first session.

Students who have attended during two sessions, and who are desirous of qualifying for the position of Itinerant Instructor in butter-making or poultry keeping under a County Committee of Agriculture and Technical Instruction or of Teacher in a School of Rural Domestic Economy for girls are admitted to a third session on attaining the required standard at the second terminal examination and satisfying the Department's examiner as to their ability to impart instruction. If their progress during the third session is satisfactory they are admitted to a fourth session to enable them to complete their training.

Attendance during at least four sessions at the Institute is necessary to qualify students for admission to the examinations for Instructor-

ships and Teacherships.

The Department do not undertake to employ or to find employment

for students on completion of their training at the Institute.

A limited number of free places and half-free places are awarded to the students who display special merit at the terminal examination of the first session to enable them to avail of a second session entirely or partially free of expense. A few similar places are also offered to students who have attended two sessions at the Institute.

. The students are at all times under the supervision of an experienced

matron

Applications for admission must be made on the prescribed form which can be obtained from—

THE SECRETARY,

Department of Agriculture and
Technical Instruction for Ireland,
Upper Merrion Street, Dublin.

# DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

# SCHOOL OF RURAL DOMESTIC ECONOMY, LOUGHGLYNN, CO. ROSCOMMON.

This School has been established in order to provide the women and girls of the neighbourhood with such practical training as will enable them to increase the comfort of their homes and improve generally the conditions under which they live. The particular object of the Department in promoting this type of instruction in rural districts in Ireland is to inculcate respect and affection for the home and the countryside, and thereby counteract the tendency to despise farm work and abandon rural life. The training aims at making efficient housewives. It does not aim at the preparation of girls for domestic service or for the factory or the shop.

The course of instruction comprises: --

Dairying—Including the making of cheese as well as butter; and the caring and feeding of cows and calves.

Poultry-keeping—The rearing and management of hens, ducks, turkeys, and geese.

Pig-rearing -The feeding and general management of pigs.

Gardening—The cultivation of such vegetables, fruits, and flowers as may be grown in the cottage garden.

Bee-keeping.

Sewing, Knitting, and Mending—Including the making and repairing of garments of every kind worn in the district.

Washing and Ironing.

Cooking—The preparation, with inexpensive and simple utensils, of those dishes for which the materials are furnished by the products of the farm and the garden. Open hearths are used.

The Cleaning and decoration of the home.

Home Industries which can be carried on in time not required for the farm or the household, such as lace-making, embroidery, carpet weaving, the making of artificial flowers, &c.

The School is open to all who wish to enter, without restriction as to religious denomination. No fees are payable; the only conditions which the pupils must fulfil are that they should be more than fourteen years of age and reside sufficiently near the School to permit of their returning daily to their homes.

In order to give the lessons direct, practical application to the home life of the people, the pupils are required to bring with them to the School, so far as may be practicable, the materials needed for their work—the cream or milk for dairy practice; the poultry to be killed or dressed; the materials for the dishes to be cooked; the cloth for new garments; the clothing to be repaired, washed, or ironed. The pupils take home with them in the evening the products of their day's labour, which serve as object-lessons to those who cannot be present at the classes.

Housewives, and others in the neighbourhood who are not in a position to attend the classes daily, are at liberty to avail themselves of the instruction in any subject, and to come to the School for advice whenever they desire it in connection with their home work; and the teachers are prepared to visit the homes of persons who desire their guidance in the difficulties of household management.

Form A 168 (a.).

# DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

#### POULTRY FATTENING INDUSTRY.

#### APPRENTICESHIPS.

The Department have made arrangements for the training, as apprentices to the poultry-fattening industry, of a limited number of young men who desire to become qualified to undertake the management of fattening stations in Ireland. Apprenticeship may extend over a period of from six to twelve months according to the efficiency of the apprentice.

The apprentices will be instructed in the preparation of suitable foods, the cramming, killing, plucking, and dressing of fowl for market,

and the management of poultry generally. They will be required to devote their whole time to such work, including the rearing of fowl, if found necessary.

Applicants for apprenticeships must be at least twenty years of age, unmarried in good health, and of strong constitution. Preference will

be given to those who have had experience in poultry-keeping.

The apprenticeships will be awarded on the result of an examination which will be held in Dublin on Wednesday, 20th June, 1906. The subjects included in this examination, which will be both written and oral, will be English, Arithmetic, and General Knowledge; a high standard will not be expected.

No expenses will be allowed to candidates in connexion with their

attendance at this examination.

Successful candidates will be called up for training as vacancies for them occur. They will receive wages at the rate of 15s, per week from the date of their commencing work, and will be required to find their own board and lodging. The engagement between apprentices and the Department may be determined at any time by one week's notice on either side.

The Department do not undertake to employ or to procure employ-

mont for apprentices on the conclusion of their training.

Applications for apprenticeships must be made on forms provided for the purpose, which can be obtained from—

The Secretary,

The Department of Agriculture and

Technical Instruction,

Upper Merrion-street, Dublin.

These forms must be returned to the offices of the Department not later than 13th June, 1906.

 $\frac{\Lambda \ 60.}{06.}(a.)$ 

# DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

#### NOTES ON CREAMERY MANAGEMENT.

The undermentioned summary of requirements for maintaining a creamery in a satisfactory condition in regard to cleanliness and order, equipment and general good management, indicates the standard to be aimed at by the Department's Inspectors and Instructors in making recommendations to creamery proprietors and managers and in reporting to the Department.

General appearance of creamery and staff.

The condition of the creamery and the appearance of the manager and employes should be such as would create a good impression. It will almost invariably be found that neatness or slovenliness in the personal appearance of the manager will be reflected in the state of the creamery Any manager who is aware of the supreme importance of cleanliness, and who nevertheless is so careless as to frequent his creamery in unbrushed and dirty clothes, or to take part in the manufacture of butter with unwashed hands and dirty finger nails, or who is otherwise slovenly in his dress and appearance, may generally be assumed to be also negligent in regard to the condition of his creamery. On the other hand, a clean and tidy manager will usually have under him clean and tidy assistants, and the qualities of cleanliness and order conspicuous in the staff will not only be extended to the creamery and surroundings but will also in some measure be communicated by force of example to any of the milk suppliers who may be inclined to be remiss in these respects.

Grounds and surroundings' The grounds and surroundings should be clean, tidy, and properly drained. The separated milk passage should be laid with an impervious pavement of sufficient dimensions (14 feet long by 12 feet wide), and sloped to a trapped drain in the centre or at the side.

By suitably planting the grounds with shrubs and trees not only will the premises present a more tasteful appearance, but in time the trees and shrubs will shelter the exterior of the creamery from dust, and will also by acting as a wind-brake prevent dust from rising and being blown into the creamery and thereby contaminating the produce. The grounds where possible should be fenced off from the road, and should be swert daily, the accumulated rubbish being carted away at least once a week.

Exterior of building.

The exterior of the building should be whitewashed not less than twice each year if constructed of masonry, concrete or brickwork, or well painted, as often as may be necessary, if constructed of wood or galvanized iron.

Sanitary accommodation. Dry earth or water-flushed w. c.'s should be placed at the corner of the grounds furthest from the building, and should be kept in a clean condition.

I ighting.

The lighting of every portion of the interior should be sufficient in order that the presence of dirt, whether on the walls or floor, or on the tanks, machines, or other appliances, may be easily observed by the staff.

The lighting area should be at least one-tenth of the floor area, preferably one-fifth, exclusive of light from open doors.

Ventilation.

The ventilation should be such that when all doors are closed there is still a good current of air to dry the floors and machines rapidly after cleaning.

Besides the ventilators on roofs, &c., fresh air inlets should be provided near the floor level.

Drainage.

All floors and platforms should have a sufficient fall (1-in. to the foot) in order that spilt milk and water used for cleansing purposes may run

quickly to the open channel, which should be situated not less than six inches from partitions or walls. This channel should be of the same depth throughout.

All drain traps and all down pipes should be situated outside the Drain traps. building.

All drains should be properly trapped, and the sewage conducted to Sewerage. such a distance from the creamery and from any road or habitation that no nuisance will arise.

An ample supply of water should be provided for cooling milk and water supply. cream, washing the butter, and for cleansing purposes generally. Care should be taken that the supply is not contaminated by surface water or the drainage from the creamery. The well should be finished off as described in the Department's Leaflet, No. 62.

Ample storage accommodation should be provided for boxes, box storage. timber, and for the sundries usually stocked at a creamery.

The store should be dry and thoroughly well ventilated. useless materials should be disposed of as soon as possible. Broken boxes, old sacking, and useless machinery lying around the creamery are most objectionable.

The lower portion of all internal walls for a height of four feet from Internal walls. the floor or platform should be coated with cement plaster (smoothly finished off with a steel trowel), or with some other smooth, durable, and impervious material.

In the case of galvanized iron buildings, the concrete work should be carried up to such a height as will provide against any splashing reaching the wood or iron work.

In order to ensure easy and thorough cleaning, the buildings should Accommodabe of such dimensions that all tanks and machines used for milk, cream, tion for, and separated milk or buttermilk, can be situated at such a distance from machines. the walls, partitions, and from other appliances or machinery that the attendants can pass freely round them for cleansing purposes, and that the splashing of milk, &c., on walls, partitions, and machines will be prevented.

A minimum distance of 24 inches is suggested.

All stands or supports for machines should be of iron, as stands of Stands and this material are more durable and more easily cleaned than similar supports. stands or supports of wood or concrete.

The staff should be provided with two sets each of overalls-for the Overalla. dairy workers, white; for the engine-driver, brown or blue. The overalls should be washed weekly or oftener if necessary.

Dirty milk, stale milk, or milk delivered in dirty cans should be Milk. rejected.

During the working period of the winter months milk should be received on not less than three days during the week.

The composite system of daily sampling milk should be adopted. (See Sampling. Department's Bulletin No. 4).

Care should be taken to have the bottles stoppered as required.

Pasteurisa-

In first-class creameries the milk should be pasteurised, either before or after separation.

Starters.

When the milk or cream is pasteurised, proper appliances should be provided for the preparation of starters.

Auxiliary

At "auxiliary" creameries and at "central" creameries with "auxiliaries" the cream should be weighed, sampled, and tested before despatch or on receipt, as the case may be.

Packing and packages.

The packages and vegetable parchment used should conform with the standards laid down by the Department. (See Department's Leaflet No. 60).

Cleansing facilities.

Provision should be made for a plentiful supply of hot water for cleansing purposes. A good washing-up trough, drain-table, and steaming-jet should also be provided, and permanent steam connections made to all piping through which milk, separated milk, cream, or buttermilk passes.

The piping should have brass unions at distances of not more than 15 feet. The permanent steam connections to piping should be made close to the pumps. The delivery pipes for separated milk and buttermilk should have permanent steam connections at the elbows below the outlet flange. The washing-up trough should have steam connections, silencers, and unions below the valves, so that the trough may be disconnected, taken out and aired.

By utilising the exhaust steam in a feed water heater, after separation is over, more than sufficient hot water for cleansing purposes will be provided without extra cost.

Daily cleansing routine and examina tion. Each day after use all machines and utensils which come in contact with milk or its products should be rinsed with cold water to get rid of milky matter, then scrubbed with hot water to get rid of grease and any particles of curdy matter, and finally rinsed with scalding water.

It would greatly facilitate the cleaning operations if all machines, utensils, and piping—as soon as finished with—are at once thoroughly rinsed with cold water so as to prevent milky matter drying on the surface of these appliances.

All floors, platforms, and portions of walls splashed with milk or milky matter should be first rinsed down with cold water, then scrubbed with hot water.

All piping through which milky matter passes should be first rinsed with cold water, then with hot water, and finally have steam blown through it until the end of the pipe furthest from the steam inlet is scalding hot.

All machines should run quietly and smoothly. The engine, separator frames, and chilling plant after work is over should be carefully wiped down with waste free from grit.

The manager should examine the creamery for cleanliness and order morning and evening as follows:—

(a) Examine all tanks, vats, &c., for stale milk indicating imperfect cleaning, more especially under the flanges and corner plates if on the inside.

- (b) Examine with the fingers for slimy growths the ends of all piping used for milk, cream, buttermilk and separated milk, the interior of the regenerative heater, and the space under the internal ledge of the heater, and more especially the separated milk and buttermilk delivery pipes. Should piping be in a suspicious condition it is recommended that a section be taken down and examined. As milk or milky water is frequently left in the delivery pipe to the separators, a close examination of this is necessary.
- (c) Lift the covers of all coolers, and examine the space under the ledge. The surface and corners of the cover should be also rubbed with the fingers to detect slimy accumulations.
- (d) Examine lids, bottoms, and gauge strips of milk cans as they arrive.
- (e) Examine with the fingers for slime the bottom of butter box and the floor underneath it. Other tanks close to the floors as well as cream vats, etc. should be examined in a like manner.
- (f) Closely examine the base of the framework of all machines, the gutter under butter-worker, the spaces behind any tanks situated close to a wall and behind the washing-up trough.
- (g) When the tops of coolers are close to ceilings or are in positions difficult of access, make a very strict examination of the tops of the coolers, the ceilings, or other surroundings as the case may be.
- (h) Examine with the hand for slime the lower portions of all walls (especially when behind machines and out of the direct line of light), the sides of platforms, and concrete blocks.
- (i) See that the edges of cream yats are not black, nor the sides greasy.
- (j) See that window ledges are tidy and not used as a scrap heap.
- (k) Examine the store and office for order and cleanliness.
- (l) See that all papers are properly filed, and books entered up daily.

The creamery should be provided with steaming and rinsing jets for Scalding jets the suppliers' cans, and these jets should be used daily.

A supply of lime should be kept on the premises, and a suitable Lime. barrel provided for the preparation of lime-water.

The lower portion of all internal walls should be whitewashed at least whitewashonce a week with thin whitewash, the dirt having been previously ing, scrubbed off. Portions of walls less than twenty-four inches distant from machines or utensils from which milk is liable to splash should be cleaned and whitewashed daily.

When the accumulated layers of whitewash make a thick coating, this should be scraped off before a fresh application is made.

Floors.

The floors thould be well scrubbed with lime and water at least once a week.

Woodwork.

The churn, butter-box, and butter-worker should be well scrubbed with lime and water once a week.

Lime water.

All utensils should be washed down with lime-water once a week in addition to the daily cleaning.

Cleaning of heater.

A mixture of fine lime and washing soda, or caustic soda alone, should be used to remove any coating from the heater.

The internal surface of a heater should on no account be scraped with a metallic instrument,

Care must be take when handling caustic sod,, as it has a strong corrosive action.

Painting and polishing.

Duties of staff

All piping and the iron work of various machines should be painted as often as is necessary, and all bright parts should be polished.

The various duties of the staff should be made clear, and all the work of the creamery should be properly apportioned among them.

#### Machinery Equipment.

The equipment of a "central" creamory should include the following in addition to the usual machinery and appliances. Machines indicated by an asterisk should be included in the equipment of an "auxiliary" creamery.

- \*(a) Facilities for heating the milk or cream and separated milk to a temperature of not less than 185° F.
  - (b) Facilities for the preparation and propagation of starters in quantity.
  - (c) Facilities for mechanical refrigeration.
- \*(d) Weighing machines for new milk, cream (in the case of an auxiliary, or of a central creamery with one or more auxiliaries), separated milk, and buttermilk.
  - \*(e) Facilities for the steaming and rinsing of suppliers' cans at the creamery.
    - (f) Cream vats.

5

- (g) Facilities for the storage of butter during the interval between the workings.
- (h) Apparatus for the determination of the acidity of milk or cream, and the determination of the percentage of water in butter.
- \*(i) A feed water heater arranged to supply hot water to the boiler or to the hot water tank.

#### Office Egipment.

Note.—The undermentioned list of office requisites is intended to meet the case of "central" creameries, or of "independent" separating stations. When an "auxiliary" is merely a branch of a "central" creamery, the office eqipment need not be so complete. In no case, however, should the items marked by an asterisk be omitted.

The office should be a separate room or space completely partitioned off from the other portions of the creamery. It should be provided with the following requisites in addition to a desk, table, and other usual equipment:—

Fireproof safe for books and cash.

\*Divided shelving for holding the various books during office hours.

Indexed file for letters. Transfer cases.

Indexed file for invoices or an invoice guard book.

Indexed box file for receipts.

\*A number of extra strong apron files with steel springs or other strong files for the following:—

(1) Orders received; (2) Petty Cash Receipts; (3) Credit Notes and Debit Notes; (4) Railway Dockets; (5) Advice Notes; (6) Butter Sales Notes; (7) Butter Merchants' Circulars; (8) Telegrams; (9) Quotations for Goods; (10) § Departmental Communications and Reports.

Stationery Rack.

\*Facilities for copying letters, invoices, and advice notes. Letter Trays.

\*Receptacle for Waste Paper.

Postal Guide-Triplicate Telegram Book.

\*Ready Reckoner.

\*Rubber Stamps.

Official Railway Map. Gazetter Time-table and Regulations of the local and other Railway Companies by which the produce of the creamery is usually carried. Manuscript table of railway rates (goods train) for produce to town with which the creamery has business connections, showing class rate, rate for smalls, exceptional or special rates by one or more routes. Delivery book or railway consignment book with counterfoil.

Complete set of books for accounts including the following:-

General Cash Book. \*Petty Cash Book. \*Order Book (duplicate). Goods Bought Book. \*Platform Milk Book. \*Order Book. \*Order Book. \*Platform Milk Book. \*Order Book. \*Milk Summary Book and Pay Sheet. \*Produce Book. Stock Book. Butter Sales Book. Goods Sold Book. Personal Ledger. Impersonal Ledger. \*Estimate Book.

April, 1906.

§ All Reports and memorands of the Department's Inspectors and Instructors, as well as all letters, and other communications received from the Department, and copies of all communications sent from the creamery to the Department should be carefully preserved in a file specially reserved for this purpose. This file, which should always be kept up-to-date, should be seen by the Inspectors and Instructors on the occasion of their visits.

#### III.—TECHNICAL INSTRUCTION.

Circular 41.

DEPARTMENT OF AGRICULTURE AND
TECHNICAL INSTRUCTION FOR IRELAND,
UPPER MERRION STREET,
DUBLIN, April, 1906.

# LACE, CROCHET, AND EMBROIDERY INDUSTRY, SEASON 1906.

SIR, OR MADAM,

I have to inform you that, with a view to affording information and guidance to the Lace, Crochet and Embroidery Classes in Ireland generally, the Department have recently instituted inquiries as to the probable needs of the market for the ensuing season, in order that Managers may be be in a position to direct the attention of the workers to the branches of the industry which would, in all probability, prove most remunerative to them.

In view of the expected demand for embroderies on muslin, it would appear that embroidery workers and Carrickmacross Lace makers would do well to devote their energies in this direction.

The results of these inquiries are summarised in the form of a brief memorandum, printed as an appendix to this circular letter. Attention is again drawn to the fact that all the large firms who were approached on the subject were united in their condemnation of the almost universal practice of forwarding, for the purpose of sale, indifferent, and even bad, work. Only the best work produced should be placed on the market, otherwise it will inevitably re-act unfavourably upon the workers. Once a bad reputation has been established—as is bound to be the case should the practice alluded to be persisted in—great damage will be done to the trade. Managers should maintain the utmost vigilance in this respect, and point out to the workers the injury to their interests which must ensue if they fail to put their best energies into their work.

I am,

Sir, or Madam,

Your obedient Servant,

T. P. GILL,

Secretary.

#### APPENDIX.

MEMORANDUM AS TO TRADE REQUIREMENTS OF THE LACE, CROCHET, AND EMBROIDERY INDUSTRY, AND SUGGESTIONS FOR 1906.

Crochet.

There is a large demand for well-made Crochet, both the fine Clones Crochet and the heavier classes of work, while a combination of these two styles is coming into popular favour. Good workmanship, fresh and tasteful arrangement of patterns, and modern shapes are, however, all essential to success.

Mechanical repetition of hackneyed forms should be avoided, while inferior and careless work should never be placed upon the market.

With regard to business details, it may be well to emphasise the im-

portance of punctual and accurate fulfilment of orders.

It must be remembered that the Crochet industry is not confined to Ireland; the work is now largely produced in France, Belgium, Switzerland, and Bohemia. Unless, therefore, orders are executed in a thoroughly satisfactory manner, there is a great possibility of business contracts being transferred to Continental centres, and thereby lost to Irish workers.

#### Carrickmacross Lace.

The demand for Carrickmacross Lace continues to be slack, and an immediate revival of the industry is not anticipated. The perishable nature of the lace, contrasted with the durable character of its chief Continental rival—Brussels Applique—and its relatively high price, have combined to seriously affect its position in the market. Accordingly, although improvement in technique during the last few years is generally admitted, few firms will now stock this description of lace to any considerable extent; and those workers who continue to practice the industry are chiefly dependent upon private orders for a market.

#### Embroidery (Sprigging).

Simultaneously with the decline in the Carrickmacross Lace industry. there has arisen a demand for fine embroidery upon muslin for dress purposes. The demand is steadily increasing, and there is reason to believe that the fashion for hand embroidery will be a permanent one.

Emboidery may be recommended as an industry which is peculiarly suitable for those districts which have hitherto produced Carrickmacross Lace, but where the workers are now thrown out of employment by the the decline in the Lace trade. Skill in embroidery can readily be acquired by trained needlewomen. There is no apparent reason why Carrickmacross Lace workers, with expert instruction and steady application, should not be equally successful at this industry.

Wages are necessarily small at the outset, but trained lace workers, with competent instruction, should soon acquire sufficient skill to enable them to undertake remunerative classes of embroidery. Special atten-

tion is directed to this subject.

#### Limerick Lace :-

Both run-lace and tambour work are in fair demand, but the latter is generally preferred as being more boldly effective in style and less costly than the run work.

Tambour base is now largely produced in Belgium, and this competition tends to reduce the price for the Limerick work.

CIRCULAR 42.

# DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND, UPPER MERRION STREET, DUBLIN, June, 1906.

SIR,

It has come to the Department's notice that in some districts it is becoming usual to make presentations to itinerant teachers at the conclusion of short courses of instruction.

The success of teachers and the efficacy of their instruction are, undoubtedly, in a great measure dependent on the extent to which they gain the good will and the esteem of those among whom they work, and when pupils feel that the well-directed labours of a zealous teacher have conferred on them real and substantial benefits, it is not unnatural that they should seek to express their recognition in some form, such as by presenting a gift purchased by the subscriptions of the class.

A practice of this kind is, however, manifestly open to abuse. In the case of a scheme of education intended mainly for the benefit of the working classes and persons of restricted means it is specially objectionable, and, should it become general, it would ultimately defeat the chief purpose of the instruction by discouraging the attendance of many to whom the contribution of even small sums is a matter for consideration. The Department are assured that the instructors as a body have no wish to receive gifts in such circumstances, and that they would welcome a regulation which would place them in a position to decline embarrassing testimonials without appearing to be discourteous. When pupils desire to express their appreciation of a teacher's services it should not be difficult to find ways of doing so other than in the form of a gift costing money.

For these reasons the Department have considered it desirable to request Committees by whom Schemes of Technical Instruction are administered to issue an instruction forbidding teachers and other officers in their employment to accept presentations or gifts of this kind in recognition of their public services under the Committee.

I am,

SIR.

Your obedient Servant,

T. P. GILL,

Secretary

To the Secretary of the Committee named in the Address.

#### DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

#### SPECIAL COURSE OF INSTRUCTION IN MANUAL TRAINING (WOODWORK).

In order to train capable artisans and others to give instruction in Woodwork (a) as Itinerant Instructors under County Schemes; (b) in Technical Schools; or (c) in Day Secondary Schools under the conditions of the Department's Regulations for such Schools, arrangements are being made to organise a Fourth Course of Instruction in Dublin under an expert Instructor. The Course will begin on Tuesday, September 4th, and will continue for about eight months.

The Course of instruction will consist mainly of practice in Woodworking and in Drawing, but will also include lessons on woods, tools, and the management of classes; and arrangements will be made to hold an examination at the close of the Course. The examination will include :-

- (a) Practical working in wood;
  - (b) Drawing;
  - (c) Written answers to questions on woods, tools, and the management of classes;
  - (d) Class demonstration;
  - (e) Drawing on the blackboard.

Provisional Certificates of competency as Manual Instructors (Woodwork) will be issued to candidates who are successful at this examination. The conditions under which the provisional certificates may be made permanent certificates are set forth in Circular 24.

A limited number of scholarships tenable at this course are offered for competition among artisans (joiners, carpenters, pattern-makers, and cabinet-makers), and others (such as architects, surveyors, and engineers), of not less than twenty-one, and not more than thirty, years of age. who undertake to attend the whole course of instruction.

The Scholarship will include free instruction, a maintenance allowance of 30s. a week while under instruction, and one third-class railway fare to and from Dublin.

Candidates with physical defects of voice, sight, or hearing, are not regarded as eligible. Successful candidates must provide a recent medical certificate of good health, an authenticated copy of certificate of birth, and testimonials of good character from two responsible persons, one of whom should be his present employer. Candidates must have been born in Ireland, or have been resident

in Ireland for three years prior to the 1st July, 1906.

The successful applicants will be required to devote their whole time to the work of the Course. The hours of attendance each day will be from 9 a.m. to 1 p.m., and from 2 p.m. to 5 p.m., except on Saturdays, when the hours will be from 9 a.m. to 1 p.m.; occasional attendance at evening instruction may also be required.

Regular and punctual attendance every day on which instruction

is given will be absolutely necessary.

The Department reserve the right to determine any Schoolarship without notice, upon being satisfied that its continuance is for any reason undesirable; and in all questions connected with the award and the tenure of the Scholarship the Department's decision shall be final.

With a view to assisting the Department in making a selection from the applicants written and practical examinations will be held as below:—

An exercise in English Composition.

Arithmetic.—(Easy exercises of a practical character involving the use of simple fractions).

Drawing.— (Candidates will be required to make working drawings of some well-known object).

Woodwork.—(A test will be set involving the making of some simple joints).

The examinations will be held at Dublin, Belfast, Cork, and Galway, on Saturday, 21st July, at the hours stated below.

English, . . . 9.30 a.m. to 10.30 a.m.

Arithmetic, . . 10.35 a.m. to 12.5 p.m.

Drawing, . . . 1 p.m. to 2.30 p.m.

Woodwork, . . 2.35 p.m. to 4.35 p.m.

At some time during the progress of the examination each candidate will be asked to read aloud a passage of English prose of not more than ordinary difficulty.

Pens, ink, paper, tools, and wood will be supplied by the Department. Candidates will be required to bring pencils, india-rubber, and mathematical instruments for the examination in Drawing.

Names of Candidates must be received in the offices of the Department, on Form S 88, on or before the 30th June, 1906. Only Candidates presenting an official acknowledgment of Form S 88 will be admitted to the examination rooms.

Candidates must themselves defray any expenses incurred by them in connection with attendance at the written and practical examinations.

Candidates who pass the written and practical examinations, and obtain the highest places in order of merit, will be required to attend a further personal examination in Dublin on a date of which due notice will be given to them. Candidates attending this examination will be allowed third-class return railway fare.

The Department do not undertake to employ, or find employment for, the candidates on the expiration of their training. It may be added, however, that all the Manual Instructors trained at the three previous courses have found employment. For the general conditions of such employment, see Circular 21. The conditions of Circular 21 are not, however, obligatory upon Committees.

FORM S. 190.

DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND, UPPER MERRION-STREET, DUBLIN.

#### COMMERCIAL AND INDUSTRIAL SCHOLARSHIPS.

The Department propose to establish, for the year 1906-7, Commercial and Industrial Scholarships in accordance with the following general conditions:—

#### (a) COMMERCIAL SCHOLARSHIPS.

A number of Commercial Scholarships (not more than six) will be granted for the Session, 1906-7. They will be of the value of £100 each, and will be tenable for one year only at such Schools as the Department may approve. The object of these Scholarships is to offer to young men, having a sound general education and, as far as possible, commercial experience, facilities for one year's training in some higher Institution providing approved courses of instruction, with a view to their employment as teachers of Commercial Subjects in Ireland.

Candidates must be at least twenty-one years of age.

Successful candidates will be required to enter into an undertaking that they will engage in the teaching of Commercial subjects after the termination of their Scholarships.

Candidates must fill in and return, addressed to the Secretary of the Department, not later than the 6th August, 1906, Form S. 191, copies of which may be had on application.

#### (b) INDUSTRIAL SCHOLARSHIPS.

The Department propose to establish for the Session, 1906-7, two Industrial Scholarships, one for persons engaged in the Woollen Industry, and one for persons engaged in the Leather and Tanning Industries. The Department will also consider applications for a third Scholarship from persons engaged in other industries.

The object of these Scholarships is to enable selected persons, who must already have been engaged in one of the higher branches of the Industry, to take a full course of instruction in an institution providing special courses of an approved character, with a view to training them for the management of such Industry. Candidates will be required to

show that there is a reasonable expectation of their being able to find suitable employment in the Industry in Ireland at the close of their instruction.

The Scholarships will be tenable at some higher institution, to be approved by the Department in which the industry is taught. They will be of the value of £80 each, and may be renewable for second and third years at the discretion of the Department.

Candidates must apply for Form S. 192, which should be returned to the Department, duly filled in, not later than the 6th August, 1906.

The Scholarship holders will be selected by the Department on consideration of the qualifications and experience of the applicants.

Certificates of good character will be required from all applicants, and selected candidates will be required to produce a medical certificate of health, and an authenticated copy of Certificate of Birth.

The decision of the department in regard to the selection of Candidates, or to any other question arising out of these Scholarships, will be final.

FORM S. 240.

DEPARTMENT OF AGRICULTURE AND
TECHNICAL INSTRUCTION FOR IRELAND.
UPPER MERRION-STREET, DUBLIN.

Directions (1) for the selection and transmission, from Science and Art Schools and Classes, of Students' Works for examination for Grants under Section XLIV. of the Science and Art Directory for 1901; and (2) for the selection and submission of Works for the Irish Secondary Teachers' Honours Drawing Certificate, which have been executed by students wishing to obtain that Certificate.

#### Works for Examination for Grants.

All drawings, paintings, modelled works, as well as specimens worked in material by the students themselves, Subject 24, from their own designs, must have been executed by registered students during the previous year in the School or class during its recognised hours of meeting; but studies executed away from the school, of growing flowers, fruit, plants, etc., of buildings, of objects in public and private collections, are eligible if each is duly marked by the Muster as executed entirely under his supervision.

Work in various materials, though not executed by the student, Subject 23, may also be submitted to fully illustrate or explain the original drawn, painted or modelled designs.

The latest day for sending up works chosen for examination for grants or for Certificates is the 31st August, 1906.

THE SIZE OF THE WORKS SUBMITTED MUST NOT EXCEED THE FOLLOWING DIMENSIONS:—

#### I.--ART.

48 in. × 48 in. for each Drawing or Painting in sub-divisions of Subject 23.

36 in. × 25 in. for each Painting from the Nude Figure.

30 in. × 25 in. for each Painting from the Antique, Still Life, Interiors, Landscapes, etc.

30 in. × 22 in. for Drawings in chalk, pencil, or similar materials.

36 in. in height and 24 in. in width for each modelled Figure, Bust, Group, etc.

36 in. × 24 in. for each modelled Panel.

The limits of size apply also to mounts used for any drawings, etc.

The greatest length of objects and specimens made in various materials must not exceed 4 ft., and the sum of the three dimensions—length, breadth, and height—must not exceed 8 ft., except that each unmounted foldable piece of woven or printed fabric, embroidery, or lace must not exceed 7 ft. in length, and the sum of its length and breadth must exceed 11 ft.

On application to the Department permission may be given, in the case of study of mural decoration, for the submission of a single specimen larger than 48 in. × 48 in. by a student who has obtained success in Design Honours at the personal examination in or before the year 1905.

#### II. SCIENCE.

48 in.  $\times$  48 in. for each Drawing, except in the case of Naval Architecture, Subjects 23g and 23h, when the length may exceed 48 inches, provided the drawing is submitted rolled.

NOTICE.—It must be clearly understood that the Department do not hold themselves responsible for any loss or damage which may occur to the works.

All reasonable cure will be taken of them while they are in the custody of the Department.

No drawings, paintings, or models less important than or closely corresponding with exercises worked at personal examinations may be submitted.

Works submitted on account of their merit as studies in modelling should be in white plaster only.

Works in the following Subjects may be submitted:—

#### I.—ART.

[For further details see pages 206 to 209 of the volume of Syllabuses and Lists of Apparatus, &c., published by the Board of Education, South Kensington.]

Subjects 861 to 8e inclusive. Drawing the human figure, or animal

forms, from the "Round" or from nature.

Subjects 9a to  $9d^s$  inclusive. Anatomical studies of the human figure or of animal forms.

Subjects 10a to 10c inclusive. Drawing flowers, foliage, landscape details, and objects of Natural History from nature.

Subject 12a. Painting ornament from the cast, &c. Subjects 14a and 14c. Painting direct from nature.

Subject 14b. Painting: Views of buildings.

Subjects 15a to 15c inclusive. Painting (from nature) groups of still-life, flowers, &c., as compositions of colour.

Subject 16a. Painting the human figure or animals in monochrome from casts.

Subjects 17b and 17c. Painting the human figure or animals in colour.

Subjects 18b and 18c. Modelling ornament.

Subjects 19a to 19f, also 19i, 19k, and 19h. Modelling the human figure or animals.

Subject 20. Modelling fruits, flowers, foliage, and objects of Natural

History from nature.

Subjects 22a to 22e inclusive. Elementary design.

Subjects 23a to 23h inclusive. Drawings from actual measurements of structures, machines, &c., applied designs, technical or miscellaneous studies.

Subject 24. Work designed and executed in material wholly by the student:—

- (a) Complete objects or articles.
- (b) Portions of objects or articles.
- (c) Surface decoration of objects or articles.

In the case of works in Subject 24 (b) and (c) a clear statement must be attached to each work indicating exactly the extent of the portion actually designed and worked in material by the student.

Work in the nature of preliminary practice work must not be sub-

mitted.

Only two examples of good work in a subject, including those for certificates (see next page) may be selected to represent any one student, excepting in the case of Subject 23a, in which sets consisting of not more than four carefully finished drawings may be submitted, and in Subjects 23 and 24, in which good examples of a student's work in the various branches of design which he is studying may be submitted. Stencil plates, wood blocks and etchings on copper plates, &c., must be accompanied by proofs and impressions from them, but it is preferable that proofs and impressions alone should be submitted.

#### II.—Science.

23a. Architecture and Building Construction,—Drawings from actual measurements, taken by the student, of existing Structures.

23b. Architecture and Building Construction.—Öriginal Designs.

23g. Machine Construction and Naval Architecture.—Drawings from actual measurements, taken by the student, of existing Machines, Ships, etc.

23h. Machine Construction and Naval Architecture.—Original

Designs.

In the subject of Building Construction under 23a and 23b, two or three sheets only of well executed drawings by a student may be submitted. These should be, as far as possible, in the nature of good work ng drawings, such as are actually prepared for use by builders.

In each of the two subjects under 23g, 23h, one good set of work of not more than three or four drawings with tracings and blue prints by a student may be submitted.

#### LABELLING AND SCHEDULING WORKS.

#### USE OF LABELS.

- 1. The class number of the school or class, the student's christian and surname, age, and Subject No. of the work, must be shown on each work submitted, or in the case of specimens in various materials a label giving this information securely fixed to each of them. The label as supplied should be used, but instead of it the required information may be printed, stamped, or incised on the work itself.
  - 2. Drawn and painted studies glazed or in frames may not be submitted.
- 3. When fresh painting has been executed over an old painting, the fact should be stated on the back of the canvas.
- 4. When mounts are used for drawings, &c., their sizes should not exceed the dimensions given on pages 1 and 2 of this Form.

#### Use of Schedule Forms 244, etc.

- 5. Form S. 244 must be carefully filled up in accordance with the instructions on page 1 of that form.
- 6 Copies of Form S. 244, &c., will be ready for issue at an early date. They will be issued in duplicate, and when carefully filled up, one of them must be returned by the 31st August, 1906, to this Office, by post, and not enclosed with the package of works. The other copy can be kept in the School for reference.
- 7. Form S 245 must be used only in respect of objects or specimens which have not been executed in material by the students, but are submitted in illustration of their designs.

#### WORKS FOR CERTIFICATES.

- 1. Only one work in each subject, or one set of works (where more than one is required under the Regulations to illustrate the subject) may be submitted in one year by the same Candidate for any one Certificate.
- 2. Every work submitted as a Certificate work must be effectively marked to show, in the case of students the number of the school or class and name of the student, and in the case of external candidates the name and address of the candidate. Labels are provided by the Department for use as convenient.
- 3. Every work submitted as a Certificate work must be entered on the Form S. 246 and forwarded with the works submitted for examination. When Certificate works have been executed by students wholly in the class rooms at the meetings of the Class during the School year, and are such as the Managers and Teachers consider eligible for examination for Grant, they should be entered in the Schedule Form S. 244 as well as in Form S. 246, but not otherwise.

- 4. It should be specially noted that errors or omissions in complying with these rules may lead to the disqualification of the Certificate work.
- N.B.—A work, whether for Examination for Grants or for Certificate, or for both, which has been once submitted for examination, may not be again submitted.

### PACKING AND TRANSMISSION OF STUDENTS' WORKS.

1. The cases for packing the students' works must be provided at the

expense of the Managers of Schools.

2. The works, when duly labelled and entered in the Schedule Form S. 244, &c., must be packed so that they will not shift nor rub one over the other, in travelling.

3. Special care must be taken to pack Oil Paintings in cases, and they should be protected by corks fastened at their corners, or by other efficient means, so that no other works may be in contact with their surfaces. No work should be sent up which is not thoroughly

dry. Oil Paintings should never be sent between boards.

4. To ensure greater safety in transit, casts, models, and specimens in materials of a fragile character, should be first carefully packed separately in light boxes, and these packages then put into an ordinary packing case, care being taken to put enough straw or wood wool, not sawdust, around each package to prevent its shaking inside the outer packing case during the transmission to the Department.

N.B.—The Department will pay carriage of all packages of School Works sent by Goods Trains.

FORM S. 243.

#### DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND, UPPER MERRION STREET,

DUBLIN, July, 1906.

SIR, or MADAM,

A supply of forms and labels to be used in connection with the submission, from your school, of Student's Works for Examination for Grants under Section XLIV. of the Science and Art Directory for 1901, and for the Irish Secondary Teachers' Honours Drawing Certificate, is enclosed herewith.

The works should be forwarded to these offices as soon as those submitted to the Board of Education, South Kensington, for the National Competition, or for Certificates, have been returned to the school, but in no case later than the 31st August. A list of the works retained for exhibition by the Board of Education, and not, therefore, available at the date of returning Form S. 244, should be given separately on that Form.

Attention is directed to the number of the school; all works to be submitted from the school must bear this number, otherwise the Department will not hold themselves responsible for any mistakes which may occur.

Additional copies of the forms enclosed may be obtained on application to the Offices of the Department.

I am,

Sir, or Madam,

Your obedient Servant,

T. P. GILL,

Secretary.

#### IV.-VETERINARY.

### AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

# IMPORTATION OF HORSES, ASSES, AND MULES INTO IRELAND. NEW ORDER.

The Department of Agriculture and Technical Instruction for Ireland have, with a view to increased security against the introduction of disease, made an Order, entitled the "Importation of Horses, Asses, and Mules (Ireland) Order of 1906" which prohibits, from 1st July next, inclusive, the landing in Ireland of horses, asses, or mules brought from any port or place in Great Britain, the Isle of Man, or the Channel Islands, unless the animals are accompanied by—

- (i.) A statutory declaration, made not more than three days before shipment, by the owner of the horses, asses, or mules, or his authorised agent, to the effect that the animals have not within the preceding two months, been affected with glanders, or farcy, or parasitic mange, nor been exposed to the infection of those diseases, and
- (ii.) A Veterinary Surgeon's Certificate granted not more than two days before shipment, to the effect that the animals were then free from the diseases above specified.

Both these documents must, in all instances, be delivered up to an authorised Inspector of the Department before the landing can be allowed. The landing will be subject also in each case to such Veterinary examination of the horse, ass, or mule on behalf of the Department as they may prescribe.

Furthermore, when the horse, ass, or mule landed under these conditions arrives at its place of destination in Ireland, the person having the animal in his possession or under his charge must forthwith give notice of the importation to the Local Authority (i.e., the County Council, or County Borough Council, as the case may be), of the district in which such place of destination is situate. The Local Authority may thereupon cause such further Veterinary inspection to be made of such imported horse, ass, or mule as they may deem requisite.

## NOTES AND MEMORANDA.

A meeting of the Board of Technical Instruction was held on Wednesday, 23rd May, at the Offices of the Department, Upper Merrionstreet, Dublin. The following were present:—

The Right Honourable Sir Horace Plunkett, P.C., K.C.V.O., F.R.S., Vice-President of the Department, in the chair;

Meetings of the Boards:

Mr. Frank Barbour; Most Rev. John Clancy, D.D., Lord Bishop of Elphin; Mr. Thomas

I. Board of Technical Edmondson, J.P.; Rev. T. A. Finlay, M.A.,
Instruction.

F.R.U.I.; Sir William G. Davis Goff, Bart., D.L.;
Sir James Henderson, D.L.; Professor John

Joly, D.Sc., F.R.S.; Alderman Michael Joyce, M.P., Mayor of Limerick; Very Rev. P. J. Lally, P.P.; Alderman Abraham Lyon; Mr. William Macartney; Mr. Patrick J. Magee; Mr. William R. J. Molloy, M.R.I.A.; Mr. Richard Sisk, and Mr. Alexander Taylor.

Mr. T. P. Gill, Secretary of the Department; Mr. George Fletcher, Assistant Secretary in respect of Technical Instruction; Mr. W. G. S. Adams, M.A., Superintendent of the Statistics and Intelligence Branch; Mr. W. Vickers-Dixon, B.A., Senior Inspector for Technical Instruction; Mr. J. D. Daly, M.A. (who acted as Secretary to the meeting), and Mr. A. Kelly were also present.

The Board appointed the following members to give evidence before the Committee of Inquiry into the organisation and working of the Department:—Sir James Henderson, D.L.; Most Rev. Dr. Clancy, Lord Bishop of Elphin; Mr. Christopher J. Dunne, and Rev. T. A. Finlay, M.A., F.R.U.I.

At the request of the Vice-President, the Assistant Secretary in respect of Technical Instruction gave a brief account of the progress at present being made under technical instruction schemes with particular reference to urban districts.

The Board had before them a statement showing the position of the funds available for technical instruction.

The Board had under consideration the division of the annual sum of £55,000, as provided by Section 16 (I.) c. of the Agriculture and Technical Instruction (Ireland) Act of 1899.

The Board concurred in the Vice-President's proposal that no change should be made in the allocation sanctioned for the last triennial period. Accordingly, the allocation of the funds for the three years ending 31st March, 1909, will be as follows:—

(Under the Act of 1899 the amount allocated for county boroughs is distributed among the county boroughs in proportion to population, and is applicable by the respective councils of those boroughs in aid of schemes approved by the Department for the purposes of technical instruction).

As regards the funds allocated for areas other than county boroughs, it was decided that the general basis of distribution, hitherto in force, should remain unchanged.

Technical instruction schemes in respect of the session 1906-7 for the following urban and county areas were brought forward by the Department;—

Urban Districts:—Coleraine, Holywood, Larne, Lurgan, Convent of Mercy, Portadown, Tipperary (joint, urban, and rural).

Counties:—Antrim, Clare, Cork, Donegal, King's County, Leitrim, Louth, Monaghan, Queen's County, Roscommon, Tipperary (S.R)., Waterford, and Westmeath.

The Assistant Secretary in respect of Technical Instruction explained the more important points of difference between the schemes submitted and those that were approved for the session 1905-6. The schemes having been discussed, the Board concurred in the application of grants from the funds of the Department in accordance with the proposals submitted.

The Vice-President stated that the revised schemes for the other urban and county areas in respect of the session 1906-7 were being completed in consultation with the local committees concerned and would be brought forward at a subsequent meeting of the Board.

On the proposal of the Most Rev. Dr. Clancy, seconded by Alderman Lyon, Mr. William R. J. Molloy, M.R.I.A., was unanimously reelected to serve on the Consultative Committee for Co-ordinating Educational Administration.

The Board had also under consideration the following matters:-

The necessity for further funds to enable local authorities to erect suitable buildings for technical schools; provision for summer courses for teachers; for a further central course for the training of manual instructors; for the maintenance of the Irish Training School of Domestic Economy in Kildare street, and for a school for training domestic servants in Kildarney.

Another meeting of the Board of Technical Instruction was held on Tuesday, the 17th July, at the Offices of the Department, Upper Merrion-street, Dublin. The following were present:—

The Right Hon. Sir Horace Plunkett, K.C.V.O., D.C.L, F.R.S., Vicc-President of the Department, in the chair; Mr. James Crozier, J.P., v.S.; Mr. Christopher J. Dunn, J.P.; Mr. Thomas Edmundson, J.P.; Rev. T. A. Finlay, M.A., F.R.U.I.; Sir William G. Davis Goff, Bart., J.P., D.L.; Sir James Henderson, A.M., D.L.; Alderman Michael Joyce, M.P., Mayor of Limerick; Alderman Abraham Lyon; Mr. William Macartney; Mr. Richard Sisk; Mr. Alexander Taylor.

Mr. T. P. Gill, Secretary of the Department; Mr. George Fletcher, Assistant Secretary in respect of Technical Instruction; Mr. W. G. S. Adams, M.A., Superintendent of the Statistics and Intelligence Branch; Mr. W. Vickers-Dixon, B.A., Senior Inspector for Technical Instruction; Mr. J. D. Daly, M.A. (who acted as Secretary to the meeting); and Mr. A. Kelly, were also present.

The Vice-President explained the arrangements that had been made for the conduct of the short Summer Courses for teachers for which provision had previously been made with the concurrence of the Board. He stated that the number of teachers attending the courses arranged this year was 787, that the number of courses provided was 74, and that the number of teachers engaged to conduct these courses was 117.

Technical Instruction schemes in respect of the Session 1906-7, for the following urban and county areas, were brought forward by the Department:—

Urban Districts.—Armagh, Ballymena, Ballymoney (Joint Urban and Rural), Banbridge, Bangor, Carrickfergus (new scheme), Lurgan, Newry, Newtownards, Pembroke, Rathmines and Rathgar, Wexford.

Counties.—Carlow, Cavan, Down, Fermanagh, Kerry, Kildare, Limerick, Mayo, Sligo, Tipperary (N.R.), and Tyrone.

The Assistant Secretary in respect of Technical Instruction, explained the points of difference between the scheme submitted and those that were approved for the Session 1905-6. The schemes having been discussed, the Board concurred in the application of grants from the funds of the Department, in accordance with the proposals submitted.

The Vice-President stated that the revised schemes for the remaining urban and county areas, in respect of the Session 1906-7, were being completed in consultation with the local Committees concerned, and would be brought forward at the next meeting of the Board.

The Board had under consideration certain proposals put forward in the scheme of Technical Instruction for the County of Galway. The County Galway Committee for Technical Instruction proposed to abandon the general scheme for capitation grants to technical classes for girls, and to substitute for it a system of direct payments to certain teachers in convent schools. The matter having been discussed at considerable length, the following resolution was adopted:—

"That in the allocation of grants for technical classes for girls, the system followed in the other counties of Ireland should be adhered to in the case of county Galway, unless it can be shown to the satisfaction of this Board that the special conditions of that county are such as to differentiate it from the other counties."

The County Galway Committee also proposed to make provision in their scheme for two University Scholarships tenable at any University in Ireland, or at any College of recognised University standing which undertook to give instruction in certain specified subjects. The Board were unanimously of opinion that this proposal should not be sanctioned by the Department, as the funds which could be made available for the scheme were inadequate for the more direct purposes of Technical Instruction in the county. At the same time the Board did not wish to arrive at any decision upon the general question, as to whether provision in Technical Instruction schemes for University Scholarships would be a legitimate application of the funds allocated for purposes of Technical Instruction. It was decided that this matter should be specially considered at the next meeting of the Board.

A meeting of the Agricultural Board was held on Tuesday, 22nd
May, at the Offices of the Department, Upper
II. Agricultural Merrion-street, Dublin. The following members of
Board. the Board were present:—The Right Hon. Sir
Horace Plunkett, P.C., K.C.V.O., F.R.S., Vice-President
of the Department, in the Chair; Mr. Alexander L. Clark, J.P.; Very
Rev. James Daly, D.D.; Mr. Robert Downes, J.P.; Colonel Nugent T.
Everard, D.L.; Sir Josslyn Gore-Booth, Bart., D.L.; His Grace the
Most Rev. John Healy, D.D., Lord Archbishop of Tuam; Most Rev.
Denis Kelly, D.D., Lord Bishop of Ross; Mr. H. de F. Montgomery,
D.L.; Mr. Patrick F. Mullally, J.P.; and Mr. Patrick J. O'Neill, J.P.

Mr. T. P. Gill, Secretary of the Department; Professor J. R. Campbell, Assistant Secretary in respect of Agriculture; Mr. R. Cantrell, I.S.O., Chief Clerk; Mr. W. G. S. Adams, M.A., Superintendent of the Statistics and Intelligence Branch; Mr. J. P. Walsh, Clerk in Charge of Accounts; Mr. J. D. Daly, M.A., Senior Staff Officer (who acted as Secretary to the meeting); and Mr. J. V. Coyle, were also present.

The Board appointed the following members to give evidence before the Committee of Inquiry into the organisation and work of the Department:—Most Rev. Dr. Kelly, Lord Bishop of Ross; Mr H. de F. Montgomery, Mr. P. J. O'Neill, and Mr. R. Downes.

On the motion of Mr. Montgomery, seconded by Most Rev. Dr. Healy, Mr. T. P. Gill, Secretary of the Department, was unanimously re-elected a member of the Consultative Committee for Co-ordinating Educational Administration.

The Board renewed their annual grant for the purposes of Manual Instruction and Domestic Economy in Rural Districts.

The Board had under consideration applications from certain Agricultural Show Societies for special grants. It was decided that no special grants should be given, and that all assistance to Shows during the coming year should be given from the funds allocated by the County Committees for this purpose.

The Board had also under consideration the action taken at the recent meeting of the Council of Agriculture in regard to the relations between the Department and the Irish Agricultural Organisation Society, when the Council decided to postpone the further consideration of the question until their next meeting.

The following matters were also under consideration :-

Special arrangements for encouraging improvement in the breed of sheep in the poorer districts in the West of Ireland; the resolution passed by the Council of Agriculture at their last meeting, with reference to the Dublin International Exhibition of 1907; a report on the progress of the Munster-Connacht Exhibition; provision of special technical advice in connection with the Bacon Curing Factory at Roscrea; Peat experiments; Fisheries administration, including applications in regard to the Lough Corrib Fisheries Association; the Ulster Fisheries and Biological Society; the Lismore Board of Conservators; the Lough Mask and Carra Fisheries Association, and Marine Police Services.

Another meeting of the Agricultural Board was held on Tuesday, 26th June, at the Offices of the Department, Upper Merrion-street, Dublin. The following members of the Board were present:—The Right Hon. Sir Horace Plunkett, R.C.V.O., D.C.L., F.R.S., Vice-President of the Department, in the chair; Mr. Alexander L. Clark, J.P.; Very Rev. James Daly, D.D.; Mr. Robert Downes, J.P.; Colonel Nugent T. Everard, D.L.; His Grace the Most Rev. John Healy, D.D., Lord Archbishop of Tuam; Most Rev. Denis Kelly, D.D.,

Lord Bishop of Ross; Mr. Arthur S. Lough, J.P.; The Right Hon. Lord Monteagle, K.P.; Mr. Patrick F. Mullally, J.P.; and Mr. Patrick J. O'Neill, J.P.

Mr. T. P. Gill, Secretary of the Department; Professor J. R. Campbell, Assistant Secretary in respect of Agriculture; Mr. R Cantrell, I.S.O., Chief Clerk; Mr. W. G. S. Adams, M.A., Superintendent of the Statistics and Intelligence Branch; Mr. J. P. Walsh, Clerk in charge of Accounts; Mr. J. D. Daly, M.A., Senior Staff Officer (who acted as Secretary to the meeting); and Mr. J. V. Coyle, were also present.

The following, amongst other matters, were under consideration:— The progress of county schemes; the work of the Agricultural Stations at Athenry and Clonakilty, and of the Forestry Station at Avondale; Schemes for early potato growing, poultry fattening and the establishment of a herd book for dairy cattle; the question of scholarships at Albert Agricultural College; calf mortality investigation in County Wexford; the proposed annual agricultural congress; and the recent order of the Department with regard to the importation of horses, and the views of the committee of the Horse-breeders' and Owners' Association of Ireland in reference thereto.

A further meeting of the Agricultural Board was held on Thursday and Friday, 19th and 20th July, at the Offices of the Department, Upper Merrion street, Dublin. The following were present:—

The Right Hon. Sir Horace Plunkett, K.C.V.O., D.C.L., F.R.S., Vice-President of the Department, in the chair; Mr. Alexander L. Clark, J.P.; Very Rev. James Daly, D.D.; Colonel Nugent T. Everard, H.M.L.; His Grace the Most Rev. John Healy, D.D., Lord Archbishop of Tuam; Most Rev. Denis Kelly, D.D., Lord Bishop of Ross; Mr. Arthur S. Lough, J.P.; The Right Hon. Lord Monteagle, K.P.; Mr. Patrick F. Mullally, J.P.; Mr. Patrick J. O'Neill, J.P.

Mr. T. P. Gill, Secretary of the Department; Professor J. R. Campbell, Assistant Secretary in respect of Agriculture; Mr. J. S. Gordon, B.S., Chief Agricultural Inspector; Mr. R. Cantrell, I.S.O., Chief Clerk; Mr. W. G. S. Adams, M.A., Superintendent of the Statistics and Intelligence Branch; Mr. J. P. Walsh, Clerk in Charge of Accounts; Mr. J. D. Daly, M.A., Senior Staff Officer (who acted as Secretary to the meeting); and Mr. J. V. Coyle were also present.

The Board had under consideration the following county and other schemes for the year 1906-7, as revised by the Department in the light of the experience gained during the past year, and as regards the

Live Stock, Agricultural Instruction Agricultural Classes, Poultry-keeping, Butter-making, Horticulture and Bee-keeping, Cottage and Farm Prizes, Subsidies to Shows, Flax Cultivation, Special schemes for Congested Districts. The schemes having been fully discussed, and certain amendments having been considered and adopted, the Board concurred in the application of funds in accordance with the proposals submitted. It was decided that the schemes as approved should be carried out without variation for the year, except in those matters which were left to the discretion of the County Committees—amendments suggested by the experience of the Committees to be considered, as usual, before the schemes for the following season were adopted.

A special scheme for the encouragement of tillage farming was discussed, and the Board decided that the scheme as amended should be further considered.

In connection with the allocation of grants for special schemes in the Congested Districts, the Board requested the Department to communicate with the Irish Government on the subject of the provision of funds for this work, and a resolution thereon was adopted. A resolution was also adopted with reference to representation of the Department and the Board on the Royal Commission about to be appointed to inquire into matters relating to the Congested Districts.

The Board made provision for the maintenance, during the coming year, of the following agricultural institutions working in connection with the Department:—The Albert Agricultural College, the Munster Institute, the Agricultural Stations at Ballyhaise, Athenry, and Clonakilty, the Ulster Dairy School, and the Agricultural Schools at Monaghan and Mount Bellew.

Provision was also made for the instruction of girls in rural Domestic Economy at the following places:—Portumna, Loughglynn, Westport, Dunmanway, Ramsgrange, Clifden, and Claremorris.

Arrangements were made for the continuance of Agricultural Scholarships at the Royal College of Science, and for the maintenance of the Department's Forestry Station at Avondale.

The Board had under consideration a financial statement showing the position of the Endowment Fund and the claims upon it. In view of the depletion of the reserve fund and the great increase of work throughout the country, it was decided that after the present year it would be necessary to re-adjust the grants in connection with the various schemes, so that the more important of them might be continued without any diminution of their scope.

The following, among other matters, were also under consideration:—Barley-growing experiments, Early Potato growing, Seed testing, Fruit growing, Poultry fattening, Pig feeding, Diseases of Animals, Peat making, Improvement of Creameries.

The Council of Agriculture, at their meeting held on the 14th November,
1905, suggested that the Department should
Advisory Committee appoint a Committee to advise them on matters
on Forestry. In accordance with this
suggestion the Department invited the following

gentlemen to act as an Advisory Committee on Forestry:-

Mr. W. F. Bailey, Estates Commissioner, 24, Upper Merrionstreet, Dublin.

Mr. Stephen J. Brown, J.P., Ard Caien, Naas, Co. Kildare.

Right Hon. LORD CASTLETOWN OF UPPER OSSORY, J.P., D.L., Granston Manor, Abbeyleix, Queen's County.

Sir Thomas H. G. Esmonde, M.P., Ballynastragh, Inch, R.S.O., Co. Wexford.

Mr. WILLIAM FIELD, M.P., Blackrock, Co. Dublin.

Mr. John Galvin, Mount Talbot, Roscommon.

Right Hon. LORD MONTEAGLE, K.P., Mount Trenchard, Foynes, Co. Limerick.

Mr. H. DE. F. MONTGOMERY, D.L., Blessingbourne, Fivemiletown, Co. Tyrone.

A meeting of this Committee was held on Monday, 9th April, 1906, at the Offices of the Department, Upper Merrion-street, Dublin, when there were present:—Right Hon. Sir Horace Plunkett, P.C., K.C.V.O., F.R.S., Vice-President of the Department, in the chair; Mr. T. P. Gill, Secretary of the Department; Professor J. R. Campbell, Assistant Secretary in respect of Agriculture; Mr. Commissioner Bailey, Mr. Stephen J. Brown, J.P.; the Right Hon. Lord Castletown, Mr. John Galvin, and Mr. H. de F. Montgomery, D.L.

Mr. J. D. Daly, M.A., Senior Staff Officer, and Mr. J. V. Coyle (who acted as Secretary to the Committee) were also present.

Since 1st April last the skippers of six steam trawlers have been convicted of breaches of the Bye-laws restricting trawling off the Irish coast. In three cases fines of £100, in one a fine of £50, and in the remaining two fines of £10 were imposed. The

net of one of the vessels was also forfeited. Four of the offenders were

detected by the Department's steam cruiser *Helga*, and two by the S.S. *Granuaile* (which, by an arrangement with the Congested Districts Board, is made available for marine police service when required).

The Department's Summer Courses for teachers opened at 9 public centres and 20 Convent centres on Summer Courses for Tuesday, the 10th July, and will continue until the 3rd August. There are 20 public and 46 Convent Courses.

The Courses are attended by 457 teachers at the public Courses and 250 teachers at the Convent Courses.

The staff engaged numbers 107; of these 69 are appointed in connection with the public Courses, and 38 in connection with the Convent Courses.

Other Courses will begin on the 7th and continue until the 31st August. Of these, 2 will be public and 6 Convent Courses. The numbers of students attending will be approximately 40 at each Course, and the staff engaged 4 and 6 respectively.

The following statement shows in comparison the figures of the Courses for 1906 and 1905:—

<del>-</del>	1906.	1905.
Total Number of Courses { Public Convent .	22 52	22 54
	74	76
Total Number of Students (Public Courses . Convent Courses	497 290	533 305
	787	838
Number of Centres of Instruction { Public . Convent .	9 21	9 22
	30	31
Staff engaged { Public Courses . Convent Courses .	78 44	70 46
	117	116

The first of the Surprise Butter Competitions for 1906 took place on the 13th June. Exhibits were received from 119

Surprise Butter creameries. Representative butter merchants of Competitions, 1906. Cardiff, Cork, Leith, and Liverpool acted as judges. On the recommendation of the judges prizes were awarded to the undermentioned competitors:—Irvinestown

Co-operative Agricultural and Dairy Society; Greencastle Co-operative Agricultural and Dairy Society; Glenwilliam Co-operative Dairy Society; Duneane Co-operative Agricultural and Dairy Society; Doons Co-operative Agricultural and Dairy Society; Finn Valley Co-operative Agricultural and Dairy Society; Harp Co-operative Agricultural and Dairy Society; Bansha Co-operative Dairy Society; Greybridge (Co-operative Wholesale Society) Creamery; Coagh Co-operative Agricultural and Dairy Society; Fivemiletown and Brookeboro' Co-operative Agricultural and Dairy Society; Grantstown (Co-operative Wholesale Society) Creamery.

A special additional prize of 10s. was awarded in each instance to the dairymaid or actual maker of an exhibit obtaining a First Class Prize.

The Munster-Connacht Exhibition at Limerick was opened on the
9th July by His Excellency the Lord LieuMunster-Connacht tenant. The Exhibition, which is of great
Exhibition. interest, has two main aims, namely, to illustrate the growth and possibilities of Irish in-

dustry on the one hand, and on the other hand to stimulate interest and thought in the questions of Irish home life and home work. The industrial and commercial section presents a large number of interesting exhibits of Irish manufacture; agriculture and fisheries are also well represented. In the Home Life and Home Industry Section there may be seen a model labourer's cottage, a number of experimental garden plots, a village shop—with a stock of Irish products—and a village hall. In connection with this Section also there will be given demonstrations and lectures in Domestic Economy.

His Excellency the Lord Lieutenant has appointed a Commission to inquire into the Irish railway question. The terms of reference are as follows:—

Railways.

To inquire into the present working of railways in Ireland, including light railways; and to report how far they afford adequate facilities for the cheap and rapid transport of goods and passengers within the island and to Great Britain, what causes have retarded the expansion of traffic upon the Irish lines, and their full utilisation for the development of the agricultural and industrial resources of the country, and generally by what methods the economical, efficient, and harmonious working of the Irish railways can best be secured.

The following gentlemen are appointed for the purpose of this inquiry:—

Sir Charles Scotter, Chairman of the London and South-Western Railway (Chairman);

The Right Honourable W. J. Pirrie, Chairman of Harland and Wolff's Shipbuilding and Engineering Company;

Sir Herbert Jekyll, K.C.M.G., Assistant Secretary Board of Trade;

Lieutenant-Colonel W. Hutcheson Poë, c.B.;

Mr. Thomas Sexton;

Mr. W. M. Acworth;

Mr. John A. F. Aspinall, General Manager of the Lancashire and Yorkshire Railway.

A Royal Commission has been appointed to inquire into congestion in Ireland. The terms of reference

The Congested Disagraphics are as follows:—

The Congested Districts: Appointment of a Royal Commission of Inquiry.

To inquire into and report upon-

The operation of the Acts dealing with congestion in Ireland, the working of the

Congested Districts Board and the Land Commission under these Acts; and the relations of the Board with the Land Commission and the Department of Agriculture and Technical Instruction;

What areas (if any) outside the districts now scheduled as congested require to be dealt with as congested;

What lands are most conveniently situated for the relief of congestion;

What changes in law or administration are needed for dealing with the problem of congestion as a whole, for facilitating the migration of the surplus population from congested areas to other lands, and generally for bettering the condition of the people inhabiting congested areas.

The following gentlemen will serve on the Commission: -

The Right Hon. the Earl of Dudley, G.C.v.o. (Chairman);

The Most Rev. Dr. O'Donnell, Bishop of Raphoe;

The Right Hon. Sir A. P. MacDonnell, G.C.S.I., K.C.V.O.;

The Right Hon. Sir John C. R. Colomb, K.C.M.G.;

The Right Hon. Sir Francis Mowatt, G.C.B.;

J. Annan Bryce, Esq., M.P.;

Conor O'Kelly, Esq., M.P.;

Angus Sutherland, Esq.

W. M'Murrough Kavanagh, Esq.

Walter Callan, Esq., Barrister-at-Law, Assistant Private Secretary to the Lord Lieutenant of Ireland, will be the Secretary to the Commission.

## STATISTICAL TABLES

## FISHERY STATISTICS-

# STATEMENT of the Total QUANTITY and VALUE of the FISH returned compared with the

		North	Coast.			East	Coast.	
	19	06.	19	05.	19	06.	19	05.
	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.
The second secon	Cwta.	£	Cwts.	£	Cwts.	£	Cwts.	£
Brill,					<b>3</b> 5	58	30	40
Soles,					57	139	30	105
Turbot,					32	213	21	114
Metal Drima Fish					124	410	81	259
Total Prime Fish,	78	49	21	20	2,059	1,554	3,181	2,186
Cod,	10	49	1		238	233	672	,
Conger Eel,	104	• 87	109	1 62	491	233 573	598	344
Haddock,	184	01	109	02	584	960		678
Hake,	•	•	•		084	960	659	1,078
Herrings,	'.		٠.	٠.	•	*	•	
Ling,	1	1	1	1	788	781	703	703
Mackerel,	•	•	•		•	•	•	•
Plaice,	19	27	71	72	700	792	1,244	1,311
Ray or Skate ,	32	12	7	3	388	207	933	713
Sprats,		•	•	•	•	•	•	•
Whiting,	•	•	•	•	609	612	696	686
All other except Shell Fish, .	43	26	•	•	3,559	1,815	1,659	854
Total,	357	202	210	159	9,540	7,937	10,426	8,812
SHELL FISH:	No.		No.		No.		No.	
Crabs,	228	3	•		300	1	360	2
Lobsters,	98	4		.	1,082	59	1,178	. 53
Mussels,	Cwts.	•	Owts.		Cwts. 824	36	Cwts. 505	65
Oysters,	No.		No.		No. 800	2	No. 11,910	42
Other Shell Fish,	Owts.	•	Owts.	•	Owts. 463	99	Cwts. 465	160
Total,		7		·	•	197		322
Total Value of Fish landed, .		209		159	•	8,134		9,134

IRELAND.

as landed on the Irish Coasts during the month of March, 1906, as corresponding period in 1905.

	South	Coast.			West	Coast.			7	Cotal.		
19	06.	19	05.	19	06.	19	105.	18	106.	19	1905,	
Quan- tity.	Value.	Quan-	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	
Owts.	£	Owts.	£	Owte.	£	Owts.	£	Cwts.	£	Cwts.	£	
3	6	1	2	1	1			<b>3</b> 9	65	31	45	
38	1 <b>3</b> 8	14	68	165	857	397	1,941	260	1,134	441	2,114	
4	13	1	2	6	27	8	43	42	253	30	158	
45	157	16	72	172	885	405	1,984	341	1,452	502	2,316	
12	15	10	14	969	<b>36</b> 8	618	307	3,118	1,986	3,830	2,527	
				31	17	16	7	269	250	689	352	
4	4	1	2	302	144	256	194	981	- 808	964	936	
.								584	960	659	1,078	
1,534	310	203	27	1,054	292	949	210	2,588	602	1,152	237	
2	2			473	275	300	174	1,264	1,059	1,004	878	
6	5	61	35	68	31	51	34	74	36	112	69	
190	198	102	70	212	233	332	273	1,121	1,250	1,749	1,726	
20	7			163	48	100	25	603	274	1,040	741	
.									•	•		
40	8	11	3	773	484	314	191	1,422	1,104	1,021	870	
196	118	65	48	654	248	227	213	4,452	2,207	1,951	1,115	
2,049	824	469	271	4,871	3,025	3,568	3,602	16,817	11,988	14,673	12,844	
No.		No.		No.		No.		No.		No.		
	.			128	1			656	5	860	2	
102	7		.	1,010	49	904	38	2,292	119	2,082	91	
Owts.		Owts.	.	Owts. 1,065	79	Owts. 373	28	Owts. 1,889	115	Cwts. 878	93	
No. 10,710	21	No. 5,544	11	No. 6,017	11	No.		No. 17,527	34	No. 17,454	53	
381	74	Owts. 359	47	Owts. 1,026	190	Owts. 1,001	175	Owts. 1,820	863	Cwts. 1,825	382	
	102	•	58	•	330	•	241		636	•	621	
	926		329		3.355		3,843		12,624		13,465	

## FISHERY STATISTICS-

# STATEMENT of the Total QUANTITY and VALUE of the FISH returned compared with the

		North	Const.			East	Coast.		
_	19	1906.		05.	19	1906.		1905.	
	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Val <b>u</b> e.	Quan- tity.	Value.	
	Cwts.	£	Cwts.	ı.	Cwts.	£	Cwts.	£	
Brill,					16	28	14	20	
Soles,	.; .		4	15	40	128	30	201	
Turbot,	.				23	140	20	108	
Total Prime Fish, .			4	15	79	296	64	329	
Cod,	. 52	33	50	49	1,376	844	1,116	830	
Conger Eel,	. 3	2	1	1	244	195	499	265	
Haddock,	. 165	84	151	73	324	436	344	355	
Hake.		01	101	10	427	706	318	536	
Herrings,		•	25	. 5	60	29	210		
Ling,	. 2	1	1	1	546	474	448	455	
Mackerel,		•	•	•					
Plaice.	. 101	91	301	231	849	913	1,112	1,526	
Ray or Skate,	13	4	144	44	210	112	489	419	
Sprats		•		22	210			```	
Whiting,		•	•	•	611	624	929	736	
All other except Shell Fish,	. 20	15	52	41	2,638	1,322	1,361	719	
THE OWNER CAROOPS TABLET I THAT					2,000				
Total, .	356	230	729	460	7,364	<b>5,9</b> 51	6,680	6,170	
SHELL FISH:-	,,								
Orabs,	No. 2,746	15	No. 640	6	No. 1,234	6	No. 2,880	26	
T - 1 - 4	989	38	332	11	1,414	77	1,888	84	
Mr	Cwts.		Owte.		Cwts. 445	44	Owts. 373	59	
Oysters,	No.		No.		No. 7,988	18	No. 6,541	21	
Other Shell Fish	Cwts.	•	Cwts.		Owts. 502	189	Сwtя. <b>3</b> 85	178	
Total,		58		17	•	329	•	368	
Total Value of Fish landed,		283	•	477		6,280	•	6,538	

NOTE.—The above figures are subject to

IRELAND.

as landed on the Irish Coasts during the month of April 1906, as corresponding period in 1905.

	South	Coast.		<u>.</u>	West	Совят.		Total.			
19	06.	19	05.	19	06.	19	1905.		106.	19	06.
Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.
Owts.	£	Owts	£	Cwts.	£	Owts.	£	Cwts.	£	Cwts.	£
6	19	1	6	15	36		•	37	83	15	26
43	166	27	129	205	873	481	1,881	288	1,167	542	2,220
9	30	4	16	22	98	26	117	54	268	50	24
58	215	32	151	242	1,007	507	1,998	379	1,518	607	2,493
108	64	8	5	170	55	307	110	1,706	996	1,481	994
•				10	2	27	9	257	199	527	278
19	11	1	1	329	125	212	104	<b>837</b>	656	708	533
				5	2			432	<b>70</b> 8	318	536
4,067	757	1,295	313	208	50	93	75	4,335	836	1,413	393
19	12	20	8	129	72	517	275	696	559	986	739
16,239	6,751	12.558	6,795	1,339	861	2.020	1,022	17,578	7,612	14,578	7,817
167	208	194	180	165	138	210	184	1,282	1,350	1,817	2,121
9 .	1			54	15	67	17	286	132	700	480
• ;											
8	2	14	5	183	<b>9</b> 5	126	75	802	721	1,069	816
140	77	125	77	259	178	278	249	3,057	1,587	1,816	1,086
20,834	8,098	14,247	7,535	3,093	2,595	4,364	4,118	31,647	16,874	26,020	18,283
No. 96	1	No.	1	No.		No.		No. 4,076	22	No. 3,580	33
108	6	185	10	1,204	52	1,776	80	3,715	173	4,181	185
Owts.		Cwts.		Cwts. 214	18	Cw1s. 241	18	Cwts. 659	62	Owts. 614	77
No. 2,898	6	No. 6,552	13	No.		No.		No. 10,886	19	No. 13,096	34
Cwts. 214	37	Cwts. 265	33	Cwts. 780	162	Cwts. 893	160	Cwts. 1,496	<b>38</b> 8	Owts. 1,543	<b>37</b> 1
-	50	•	57		232	•	258	•	664		700
	8,148		7,592		2,827	. 1	4,376		17,538		18,983

correction in Annual Returns.

## FISHERY STATISTICS-

## STATEMENT of the TOTAL QUANTITY and VALUE of the FISH returned as compared with the

			North	Coast.			East (	Coast.	
••		1906.		19	05,	1906.		1905.	
÷		Quan- tity.	Value.	Quan- tity.	Value	Quan- tity.	Value.	Quan- tity.	Value.
		Owts.	£	Cwts.	£	Cwts.	£	Owts.	£
Brill,						21	41	9	11
Soles,		1	3	31	108	85	290	135	757
Turbot		2	6	14	10	31	136	32	216
Total Prime Fish, .		3	9	45	118	137	467	176	984
Cod,		147	34	345	110	975	777	760	604
Conger Eel,				1	1	433	303	389	324
Haddock,		300	185	492	204	342	425	402	<b>37</b> 9
Hake,			• •			399	600	434	678
Herrings,		2 <b>9,93</b> 8	26,185	16,098	14.267	5.041	1,032	3,927	1,242
Ling,	.		• .	4	2	752	579	658	542
Mackerel,		187	57	279	45				
Plaice,		243	181	506	389	9 <b>2</b> 8	913	1,335	1,450
Ray or Skate,		14	3	349	87	<b>65</b> 8	313	517	<b>30</b> 6
Sprate,			•				•		
Whiting,						653	580	900	714
All other except Shell Fish,.		26	19	250	94	2,524	1,269	2,420	1,152
Total, .	•	30,858	26,673	18,369	15,817	12,842	7,258	11,918	8,375
Shell Fish		No		No.		No.		No.	
Crabs,		3,766	25	7,264	26	12,268	103	12,604	116
Lobsters,		2,811	101	3,619	115	3,102	149	6,232	263
Mussels,		Owts. 320	3	Owts.		Owts. 319	18	Cwts.	7
Oysters,		No.		No.		No.		No.	•
Other Shell Fish, .		Cwts.	•	Cwts. 20	4	Owts. 654	283	Cwts. 752	174
Total,		-	129		145		508	•	560
Total Value of Fish la	nded,	•	26,802		15,462		7,761	•	8,935

NOTE.—The above figures are subject to

landed on the IRISH COASTS during the Month of May, 1906, as corresponding period in 1905.

IRELAND.

	South	Coast.		West Coast,					To	otal.	
19	06.	19	05.	19	06.	19	05.	19	06.	190	)6.
Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.	Quan- tity.	Value.
Owts.	£	Owts.	£	Cwts.	£	Cwts.	£	Cwts.	£	Owts.	£
1	4	5	13	32	45	4	5	54	90	18	29
70	131	43	199	92	333	266	585	248	757	475	1,64
4	17	5	15	16	77	37	131	53	236	88	37
75	152	53	227	140	155	307	721	355	1,083	581	2,05
104	83	453	449	56	23	93	48	1,282	917	1,651	1,21
38	25	68	46	6	2	12	4	477	330	470	37
12	10	124	74	686	235	210	103	1,340	855	1,258	76
		5	4			-	.	399	600	439	68
8,962	3,012	18,597	3,528	302	164	475	203	44,243	30,393	39,097	19,24
73	63	525	392	101	41	76	33	926	683	1,263	96
64,882	13,772	97,045	16,541	31,909	8,320	48,667	11,274	96,978	22,149	145,991	27,86
183	2 <b>0</b> 5	222	210	335	264	443	317	1,689	1,563	2,506	2,36
38	10	39	5	16	4	43	12	726	330	948	410
2	4							2	4	•	•
67	13	118	29	237	107	304	130	967	700	1,322	87
175	100	156	80	672	481	1,032	449	3,397	1,869	3,858	1,776
74,611	17,449	117,405	21,585	34,460	10,096	51,692	13,294	152,771	61,476	199,384	58,57
No.		No.		No.		No.		No.		No.	
486	2	834	17			347	3	16,520	130	21,049	169
974	33	2,416	87	3,148	154	5,527	188	10,035	437	17,794	653
Owts.		Cwts.		Owts. 20	1	Owts.		Cwts. 659	22	Owts.	;
No.		No.		No.		No.		No.		No.	
Owta 230	23	Owts. 190	19	Cwts. 797	131	Cwts. 865	149	Cwts. 1,681	<b>3</b> 87	Owts. 1,827	344
	58	•	123		286		340		976		1,16
	17.507		21,708		10,382	<del></del>	13,634		62,452		59,73

correction in the Annual Returns.

STATEMENT of the TOTAL QUANTITY of FISH landed on the ENGLISH and Welsh Coasts during the Month and Five Months ended 31st May, 1906, compared with the corresponding Periods of the Year 1905.

					M	lay.	Five Mo	nths ended May.
					1906.	1905.	1906.	1905.
						QUA	NTITY.	
Brill.					Owts. 2,076	Owts. 2,563	Cwts. 6.838	Cwts 11,534
Soles,	·		•••		8,017	8,625	21,374	81,199
Turbot.			•••		7.309	7,056	22,303	29,432
Prime Fi	h not	SATIST				-,000		
guished	l.		me Fish	1	17,402	18,244	50,515	72,165
Bream,					2,672	2,474	8,741	12,666
Catfish.				. !	8,873	6,683	25,062	20,824
Coalfish.	•••	•••	•••		15,491	11,585	50,437	43,697
Cod.	•••		•••		208,261	143,410	882,606	674,240
Conger Ee		•••	•••		4,278	6,186	17,681	24,247
Dabs,		•••		1	9,524	8,252	36,393	41,302
Dogfish,	•••		•••	•••	1,393	819	5.301	8,468
Dory,	•••				273	860	906	1,550
Flounders			-••	•••	645	300	2,515	1,550
Gurnards,		- •	•••	•••	9,079	0.100	36,118	41.014
Haddock,	•••	•••	•••	•••		9,188	810,813	41,014
Hake.		•••	•••	•••	233,206	198,582	169.957	850,490
Halibut.	•••	•••	•••	•••	87,351	90,965		181,908
Latchets (	Tank	•••	•••	•••	19,415	15,759	51,411	42,938
Lemon Sol		•••	•••		227		740	
	•	•••	•••	•••	4,878	4,745	16,757	18,111
Ling,	•••	•••	•••	•••	24,112	24,805	79,674	84,296
Megrima,		···	•••	•••	5,857	6,627	16,937	18,216
Monks (or Mullet (Re			•••	•••	3,799	3,140	14,807	16,805
		•••	•••	•••	8	78	242	618
Plaice,	•••	•••	•••	•••	84,035	83,705	<b>246,43</b> 5	372,304
Pollack,		•••	•••	•••	677	583	5.644	5,998
Skates and	•	•••	•••	•••	32,707	31,341	120,866	147,478
Torsk,	•••	•••	••		718	690	2,775	3,198
Whiting,	•••	•••	•••	•••	18,825	26,362	98,952	142,203
Witches,	•••	•••	•••	•••	4,141	4,723	10,814	17,827
Herrings,		•••	•••	•••	32,045	35,087	70,153	80,351
Mackerel,		•••	•••	•••	156,990	386,519	203,368	609,309
Mullet (G		•••	•••	•••	60	_	334	_
Pilchards,	•••	•••	•••	•••		•	74	1,242
Sprats,	•••	•••	•••	•••	-	16	3,258	25,454
Whitebait	•	•••	•••	•••	701	_	2,394	-
Fish not se	eparate	ly dis	inguish	ed,	29,733	27,974	115,005	120,851
	Tot	al,	•••	•••	1,017,676	1,148,847	3,157,685	3,679,770
Shell Fish	:				No.	No.	No.	No.
Crabs,	•••				1,597,680	1,485,685	2,877,218	3,317,018
Lobster	3,	•••	•••		76,177	88,399	172,106	190,009
Oysters	•••	••			1,192,300	4,745,200	10,742,430	16,789,600
					Owts.	Owts.	Cwts.	Cwts.
Other S	hell Fis	h,		••.	36,538	26,408	164,365	151,566

NOTE.—The figures for 1906 are subject to correction in the Annual Returns.
Flounders, Latchets (Tubs), Mullets (Gray) and Whitebait, were not separately distinguished in 1905.

STATEMENT of the TOTAL VALUE of FISH landed on the ENGLISH and WELSH COASTS during the Month and Five Months ended 31st May, 1906, compared with the corresponding Periods of the Year 1905.

	_							ths ended May.
				-	1906.	1905.	1906.	1905.
						VAL	UE.	
Brill,					£ 5,658	£ 5,730	£ 27.986	32,272
Soles.		•••		•••	39,067	41,189	184,470	192,522
Turbot,	•••	•••	•••		23.326	21,975	119,927	115,212
Prime Fi					_	22,010		-
guishe	d.	-	me Fish		68,051	68,894	332.383	340,000
Bream.			•••		786	840	5.384	4,989
Catfish,	•••			•••	2,750	2,069	11,858	8,626
Coalfish,	•••	•••	••	•••	4,622	3,214	22,858	15,43
Cod.	•••	•••	••	•••	95,496	65,950	599,399	421,698
Conger E			•••		3,186	3,660	18,190	17,660
Dabs.		•••			5,658	4,857	39,827	•
Dogfish,	•••	•••	•••	•••	419	300	2,844	34,05
-	•••	•••	•••	•••	231		988	2,42
Dory,			•••	••• į		238		1,30
Flounder			•••	•••	381		1,806	
Gurnard		•••	•••	•••	2,538	2,736	13,609	13,960
Haddock		•••	•••	•••	116,803	103,025	670,545	633,83
Hake,	•••	•••	•••	•••	44,823	35,484	151,185	122,98
Halibut.	•••	•••	••	•••	29,767	22,570	111,800	93,59
Latchet (		•••	***	•••	125	_	619	_
Lemon S	oles,	•••	•••	*** .	11,627	8,186	53,580	43,15
Ling.	•••	•••	•••	••	12,259	10,997	53.882	54,33
Megrims	••	•••	•••		3,433	3,759	17,024	13,12
Monks (o	r Angle	rs),	•••	••• '	1,273	1,014	7.811	6,86
Mullet (1	Red).	••	•••	••• ,	25	109	752	1,27
Plaice,	•••	•••	•••	•••	70,043	67,203	354,320	368,05
Pollack,	•••	•••	•••	•••	370	289	4,004	3,72
Skates at	nd Rays	ł,	•••	•••	17,182	14,547	95,643	89,21
Torsk,	•••		•••	•••	261	244	1,534	1,43
Whiting,	•••	•••	•••		9,400	10,880	72,603	74,16
Witches,				•••	3,717	4,203	19.662	19,53
Herrings	,		••		9,561	10,738	17,615	19,87
Mackere	i,				83,350	107,332	134,557	275,64
Mullet (	iray).		•••	•••	125		988	-
Pilchard						_	40	24
Sprats.	•••		•••	•••	}	4	3.021	3,91
Whiteba		•••	•••	. !	797	_ 1	3,015	
Fish not			tinguisl	ied	12,530	15,653	68,753	68,33
	-	otal,		••	611.589	568,945	2,892,049	2,753,40
Shell Fis	h •							
Crabs.				}	12,915	12,667	27,445	00 00
Lobste		•••	•••	•••		3,973	9,002	29,88
		•••	•••		3,587			9,06
Oyster	•	···	•••	•••	3,177	14,048	43,605	49,49
Otner	Shell F	•	•••		11.431	9,741	47,547	41,26
	Total,	•••	•••	••	31,110	40,429	127,599	129,65
	Total v	alue o	all Fis	h	642,699	609,374	3,019,648	2,883,06

NOTE.—The figures for 1906 are subject to correction in the Annual Returns.
Flounders, Latchets (Tubs), Mullet (Gray), and Whitebait were not separately distinguished in 1905.

STATEMENT of the Total Quantity and Value of the Fish returned as landed on the Scottish Coasts during the Month and Five Months ended 31st May, 1906, compared with the corresponding periods for the Year 1905.

				M	lay.	Five Mor	ths ended May.
				1906.	1905.	<b>190</b> 6.	1905.
					QUA	NT <b>IT</b> Y.	
0 11-				Owts.	Owts.	Cwts.	Owts.
Sparling, Turbot,	•••	•••	•••	571	636	120 2,263	88
Cod			•••	140,406	105,107 855	409,606	382,415
Conger Eel Flounders, Plaic	e Brill		•••	7,675	7 887	11,432 30,037	12,218
naddock,	•••	••	•••	78,316	7,887 82,204	368,196	2,383 2,383 332,415 12,218 31,473 374,318 14,518 659,766 8,929 71,046
Halibut, Herrings,	•••	•••	•••	4,311 184,724	6,435	12,508 553,346	14,518
Lomon Soles,	•••	•••	•••	2.493	2,719 20,190 27,055 13,934	10,001	8.929
Ling, Mackerel,	•••			12,016	20,190	69.319	71,048
Saith (Coal Fish	0	•••	•••		17.055	3,371 54,137	48 330
Skate and Rays		•••	•••	9,441	13,934	54,137 51,997	52,558
Sprats, Torsk (Tusk),	•••	•••	•••	1.214		368 5.255	1,847
Whiting,	•••	•••	•••	9,674	4,531 16 057	66,856	87,988
Fish not separa		stingui	shed,	8,000	8,406	36,778	48,330 48,330 52,558 1,347 8,121 87,988 37,320
_	otal,	•••		474,627	459,412	1,675,590	1,743,131
Shell Fish :				No	No.	No.	N-
Crabs,	•••	•••		No. 519,875	No. 385,303	No. 1,106,269	No. 798,576 398,420
Lobsters,	•••	•••	•••	50,368	88,145	204,134	398'420
Oysters,	•••	•••	•••	260		13,919	107,000
Clams,				C **ts. 300	Cwts. 240	Owts. 4,792	Owts. 4 220
Mussels,	•••	•••		6,580	6,466 5,704	48,461	4 220 38 012 28,620
Other Shell F	ish,	•••	•••	4,048	5,704	23,842	28,620
					VAL	UE.	
G 11				£	£	£	£
Sparling, Turbot,	•••	•••	:::	1,606	1,748	177 7,751	259 8 986
COO				35.574	84,588 847	164,832	141,146
Conger Eel, Flounders, Plaic	o Rein	•••	•••	9,963	9,711	6,756 38,611	8,286 141,146 5,663 38,112
Haddock,	е, вги	, 	:::	41,897		229,836	
Halibut	•••	•••	••	7,311	8 889 47,064 4,570 6,143	23 644	25 029 152,970 18,460 24,892
Herrings, Lemon Soles,	•••	•••	•••	58,055 5,178	4,570	177,499 22,004 22,797	102,970 18 480
Ling.	•••	••	•••	5,178 4,346	6,143	22,797	24,892
Mackerel, Saith (Coal Fish		•••	•••	312 2.358	2 460	1,886 11,339	214 9 210
Skate and Rays,	1)	•••	•••	2.707	2,469 2,770	17.659	9,212 15,292 222
Sprats, Torsk (Tusk),	•••	•••	•••	280	699	76 1,362	, 222
Whiting,	•••		•••	4.628	5.319	30,983	1 741 35,125 28,888
Fish not separa except Shell I	tely di	stingui	shed,	4,248	5,319 3,625	25, <b>05</b> 0	28,888
-	otal,			178,606	167,965	781,262	731,590
Shell Fish: -							
Orabs, Lobsters,	•••	•••	•••	2,972 3,631	2,354 4,278	6,631 12,043	10,673
Oysters,	•••	•••	::	104		560	5,678 12,827 429 610
Clams,	•••	•••	•••	28   397	34 381	694 2,850	610 2.401
Mussels, Other Shell Fi	sb,	•••	:::	1,431	1,484	6,588	8,725
Total,		•••		8,563	8,526	29,366	28,665
M-4-1 T7-1		ish land	10.1	187,169	176,491	810,628	760,255

NOTE.—The above figures are subject to correction in the Annual Returns.

STATEMENT of the TOTAL QUANTITY and VALUE of the FISH returned as landed on the IRISH COASTS during the Month and Five Months ended 31st May, 1906, compared with the corresponding Periods of the Year 1905.

Cota	ive Months ended 31st May.	ay. Five	М					
Brill	1906. 1905,	1905. 190	1906.	ĺ				
Brill   Soles	r.	QUANTITY.		1				
Soles								
Turbot,		475	04 248					
Cod,	188 264					•••		
Hake	1,281 2,163	581 1	355		sh,	ime Fis	Total Pri	บ
Hake	8.664 11.774	1.651	1.282	1				Cod.
Hake	1,243 2'370	470 i	477		•••		Eel,	Conger
Herrings	4,541 5 311	1,258						Haddoo
Sprats	1,876 2,126 59,041 52,364		44.243					
Sprats	3,724 4,714	1.263	926					Ling.
Sprats	114,648 164,280	145,991 114					rel,	Macker
Sprats	5,918 8 602	2,000 5	1,689	1			a. :	Plaice,
Fish not separately distinguished.         3,397         3,858         13,132         10, except shell fish.           Total.           152,771         199,384         213,672         274,           Shell Fish:           16,620         21,049         21,451         25,           Lobsters,           10,035         17,794         18,452         27,           Oysters,            Cwts.	1,940 0,094	_ <del>54</del> 5					BESTC,	Kay or
Fish not separately distinguished.         3,397         3,858         13,132         10, except shell fish.           Total.           152,771         199,384         213,672         274,           Shell Fish:           16,320         21,049         21,451         25,           Lobsters,           10,035         17,794         18,452         27,           Oysters,            659         40         7,070         3,858           Mussels,            659         40         7,070         3,40           Other Shell Fish,          1,681         1,827         6,745         8,           VALUE.           Turbot,          236         3,72         1,249         1,           Total Prime Fish,          1,083         2,050         5,867         9,           Cod,            330         3,75         1,098         1           Cod,             30         3,40         3,	4 653 6.194	1.322					ig	Whitin
Total,	13,132 10,448	3,858		ished.		rately d	ot separ	Fish no
Mussels,         Cwts.	213,672 274,029	199,384 213	152,771	•••	•••			-
Mussels,         Cwts.	No. No.	No. N	No.				ish:-	Shell F
Mussels,         Cwts.	21,451 25,739	21,049 2				•••		
Mussels,         Cwts.	18,452 27,681	17'794				•••	stern,	Lobe
Mussels,         Cwts.	72,829 188,804	- 79			•••	•••	te <b>rs</b> ,	Oyst
Mussels        659       40       7.070       3.         Other Shell Fish.        1.681       1,827       6.745       8.         VALUE.         Erill.       £       £       £       2.       398       398       508       508       7.       1,649       4,220       7.       7.       7.       1,249       4,220       7.       7.       7.       1,249 <th></th> <th>Curta Cu</th> <th>Curto</th> <th></th> <th></th> <th></th> <th></th> <th></th>		Curta Cu	Curto					
Other Shell Fish,         1,681         1,827         6,745         8,           VALUE.           E         £							BAIR	Mara
Soles	6,745 8,760					Fish.	er Shell	Othe
Turbot,						•		
Turbot,		, ,						
Turbot,          236         372         1,249         1,           Total Prime Fish,          1,083         2,050         5,867         9,           Cod,          917         1,211         6.868         7,           Conger Eel          330         375         1,098         1           Haddock          855         760         4,014         3           Hake,          600         682         3,341         3,           Herrings,          30,393         19,240         33,393         22           Ling,          683         969         3,430         3,           Mackerel,          22,149         27,860         31,529         37           Plaice,          1,563         2,366         6,974         9           Ray or Skate,          330         410         1,991         2,           Storats,          68         -68         -68         -68         -68         -68	398 4,220 7,736	90	± <sub>oo</sub>	ļ				Del11
Turbot,          236         372         1,249         1,           Total Prime Fish,          1,083         2,050         5,867         9,           Cod,          917         1,211         6.868         7,           Conger Eel          330         375         1,098         1           Haddock          855         760         4,014         3           Hake,          600         682         3,341         3,           Herrings,          30,393         19,240         33,393         22           Ling,          683         969         3,430         3,           Mackerel,          22,149         27,860         31,529         37           Plaice,          1,563         2,366         6,974         9           Ray or Skate,          330         410         1,991         2,           Storats,          68         -68         -68         -68         -68         -68	4.220 7 736	1.649						
Total Prime Fish, 1,083 2,050 5,867 9,  Cod 917 1,211 6.868 7,  Conger Eel. 330 375 1,098 1,  Haddock, 855 760 4,014 3,  Hake, 600 682 3.641 3,  Herrings, 30,393 19,240 33,993 22;  Ling, 683 969 3,430 3,  Mackerel, 22,149 27,860 31,529 37,  Plaice, 1,563 2,366 6,974 9  Ray or Skate, 330 410 1,091 2,  Styrats, 4 — 68	1,249 1,314	-'37ž					t,	
Cod,          917         1,211         6.868         7,           Conger Eel         330         375         1,098         1           Haddock,         855         760         4,014         3           Hake,         600         682         3,841         3,841           Herrings,         30,393         19,240         33,393         22           Ling,         683         969         3,430         3,           Mackerel,         22,149         27,860         31,629         37           Plaice,         1,563         2,366         6,974         9           Ray or Skate,         330         410         1,091         2,68           Styrats,         4         68         68         68         68					m la		m-41 TO 1	
Herrings,	, , , , , , , , , , , , , , , , , , , ,		1,083	•••	811,	nme Fig	TOTAL Pri	
Harch,	6.868 7.871	1,211					•••	Cod.
Harch,	1,098 1 357	370	330				r Eel.	Conger
Harch,	4,014 3 783	760					ck,	Haddoo
Mackerel,       22.149     27,860     31,529     37       Plaice,        1.563     2,366     6,974     9       Ray or Skate,        330     410     1,091     2,       Surats,       4      68	3,041 3,406	10 940	4U 305					
Mackerel,       22.149     27,860     31,529     37       Plaice,        1.563     2,366     6,974     9       Ray or Skate,        330     410     1,091     2,       Surats,       4      68	3,430 3,857	969						Ling.
Plate, 1.563 2,366 6.374 9 Ray or Skate, 330 410 1,091 2, Surnts, 4 — 68	31,529 37 191	<b>27,86</b> 0 3	22,149				rel	Macket
Ray of Skate, 330 410 1,091 2,	6.974   9.028	2,366						Plaice.
1 SUPATS 4     00		410						
Fish not separately distinguished, 1.869 1,775 7,715 5,	00 13	873		•••	•••	•••	· · ·	Whitin
				ushed.	disting	rately	ot separ	Fish n
except shell fish.						fish.	pt shell f	exce
Total, 61,476 58,571 110,362 111,	110,362 111,118	58,571 11	61,476	•••	•••	•••	Total.	
Shell Fish:-	100		1					
						•••		
Lobsters, 437 653 939 1, Ovsters, 266		_003	437					
	784 409	7	22			•••	areja	Mins
		346				Fish.	er Shell	Oth
The state of the s								-/-
						·		l
Total Value of Fish Landed, 62,452 59,739 114,421 114,	114,421 114,990	59,789 11	62,452	d,	h Lande	of Fish	al Value	Tota

NOTE.—The figures for 1906 are subject to correction in the Annual Returns,

Summary of Quarterly Average Prices for each Province and for the Whole of Ireland of Crops, Cattle, and Sheep, and other Agricultural Produce for the Quarter ended 31st March, 1906, and for the Whole of Ireland for the corresponding Quarter of 1905.

line nergin		Prov	INCE.		Whole of	Whole of
PRODUCT.	Leinster.	Munster.	Ulster.	Con- naught.	Ireland, 1906.	Ireland, 1905.
Orops :—	8. d.	s. d.	8. d.	s d.	8. d.	8. d.
Wheat, per 112 bs. White Oats,, Black Oats,, Barley,, Potatoes,, Hay,, Grass Seed— (Perennial Rye), .,	6 74 6 44 6 04 2 7 3 11	6 4½ 6 11½ 6 4½ 6 1½ 2 9 2 10½	- 6 2½ 2 1½ 2 11	5 8 - 1 104 2 84	6 4½ 6 13 6 4½ 6 0½ 2 5½ 3 5½	6 03 5 104 5 84  2 114 2 104
(Italian Rye), ,, Flax, . per 14 lbs.	-	_*	12 10 <sup>3</sup> 6 11 <sup>1</sup> / <sub>2</sub>		12 10# 6 114	7 114 6 74
STORE CATTLE:-	£ s. d.	£ 8. d.	L s. d.	£ s. d.	£ s. d.	£ s. d.
One year old, per head, Two years old, ,, Three years old, ,, Springers	7 0 9 9 16 4 11 13 4 14 11 3	7 13 4 9 19 6 12 10 8 12 13 5	.5 6 10 7 15 1 •8 10 11 12 13 7	6 3 0 8 16 6 11 16 4 13 5 2	7 1 3 9 8 6 11 15 11 13 0 2	7 5 11 9 19 11 12 12 5 13 5 4
STORE SHEEP :-		 			l	
Lambs, per head, Over 12 & under 24 months old, Two years old and npwards,	1 17 5 2 2 0 2 5 1	1 19 8 2 0 3 2 6 0	- -	1 15 2 2 3 5 2 1 9	1 18 0 2 2 1 2 3 5	1 13 4 2 1 4 2 3 1
MISCELLANEOUS:	s. d.	8. d	s. d.	s. d.	s. d.	s. d.
BUTTER, . per 112 lbs.	102 9	107 1 <b>0</b> 2	111 9	99 7 <del>1</del>	107 64	101 11
Eggs, per 120,	8 51	7 7%		7 2	7 11	7 81
PORK, . per 112 lbs.	51 3½	52 24	53 31	52 34	52 3	46 41
BMEF,		-	_	-	54 14	55 0}
MUTTON, " WOOL, per lb.	 0 114	i 1	_	-	74 4 0 11 <del>1</del>	69 74 0 11

3rd Class.

STATEMENT showing the WEEKLY AVERAGE PRICES of WHEAT, OATS, and BARLEY per 112 lbs., computed from Market Returns of certain quantities of these Cereals supplied to the Department of Agriculture and Technical Instruction for Ireland by Inland Revenue Officers, during the QUARTER ended 31st MARCH, 1906.

Roto	Returns received in the Week ender  1906.  Sanuary 6, 13, 20, 27,  Pobruary 3, 10,		W	ILBAT.		O	ATS.		Ва	RLEY.
receiv	ed in	Price	rage e per lbs.	Quantity.	Price	rage e per lbs.	Quantity.	Price	rage e per lbs.	Quantity.
190	<b>16</b> .	8.	d.	Owts. of 112 lbs.	8.	d.	Owis, of 112 lbs.	8,	d.	Cwts. of 112 lbs.
January	6,	6	4	10	6	0	5,666	6	0	40
**	13,	6	4	27 4	6	0}	5,361 1	6	12	1061
1,	20,	6	8	71	6	13	6,6401	6	0	120
**	27,	6	4	26	6	12	6,966.}	6	03	138
Februar	y 3,	6	4	139	6	21	7,5283	6	0	80
**	10,	6	6	7 }	6	3	6,499	6	0	60
**	17,	6	4	111	6	34	5,610	-	-	
**	24.	1	- !	-	6	31	4,820	-	-	_
March	3,	-	-!		6	43	5, <b>025</b> g	-	_	
**	10,	-	-		6	4	4,6727	.	-	
••	17,	İ			6	4	3,1257	-	-	_
"	24,		- !		6	44	3,7661	-		
,,	31,	-	-	-	6	54	4,242	-		-

TABLE showing the AVERAGE PRICES per 112 lbs., LIVE WEIGHT, of FAT CATTLE and FAT SHEEP sold in the DUBLIN MARKET during the QUARTER ended 31st MARCH, 1906, and also for the corresponding period during the nine preceding years.

Danagara					YE	AR.				
DESCRIPTION.	1906.	1905.	1904.	1903.	1902.	1901.	1900.	1899.	1898.	1897.
Fat Cattle, .	30 111	31 54	30 81	<b>33</b> 10	.s. d. 32 64 34 74	32 42	33 2	31 8	s. d. 29 94 36 94	31 44

STATEMENT showing the NUMBERS of CATTLE and SHEEP in respect of which "LIVE WRIGHT" Returns have been furnished to the Department of Agriculture and Technical Instruction for Ireland, as under, during the Quarter ended 31st March, 1906.

		Numbers inch	Numbers included in Returns of Live Weight of Fat Cattle furnished by	if Live Weight of d by	Numbers included in Returns of	Total	Numbers inclu Live Weigh furni	Numbers included in Returns of Live Weight of Fat Sheep furnished by	Total
WREK ENDED	NDED	Dublin Corporation Market Authorities.	Mr. Gavin Low (Dublin).	Mr. John Robson (Belfast).	Live weight of Store Cattle furnished by Official Reporters of Prices.	Number of Cattle included in Returns,	Dublin Corporation Market Authorities.	Mr. Gavin Low (Dublin).	Number of Sheep included in Returns.
January 6	•	<b></b>	215	22	l	305	æ	183	818
., 13.	•	63	166	23	07	168	25	200	302
. 20.	•	8	131	<b>56</b>	1	181	æ	503	256
., 27, .	•	65	151	83	1	385	9	130	170
February 3, .	•	55	134	æ	İ	766	8	252	. 888
. 10	•	88	131	&	ı	500	*	166	201
. 17.		69	781	88	1	267	19	288	883
	•	<b>3</b> 2	152	22	1	232	8	233	343
March 3.	•	92	171	ន	1	23.	æ	137	160
. 10.	•	<b>19</b>	139	16	909	272	<b>Ş</b>	120	160
. 11.	•	<b>8</b>	103	83	1	<b>76</b> 1	S	137	172
12.	•	67	120	16	1	£0 <b>3</b>	8	8	120
		79	101	26	1	181	23	12	991
Totals,		739	1.869	319	8	3,037	697	2,373	2.842

#### DISEASES OF ANIMALS IN IRELAND.

NUMBER of OUTBREAKS of SWINE-FEVER, and Number of SWINE returned as having been SLAUGHTERED in Ireland, under the Diseases of Animals Act of 1894, in the undermentioned period, by Order of the Department.

				SWI	NE-FEVER.
,	Quarter (	nded		Outbreaks confirmed.	Swine Slaughtered as Diseased or as having been Exposed to Infection.
31st March, 1906,			•	9	214

NUMBER of OUTBREARS reported as having taken place, and NUMBER of ANIMALS returned as having been attacked by ANTHRAX and GLANDERS in Ireland in the undermentioned period.

Owenter and al	ANTH	IRAX.	GLAN (includin	DERS g Farcy).	Epize L <b>ym</b> ph	ootic angitis.
Quarter ended	Outbreaks Reported.		Outbreaks Reported.		Outbreaks Reported.	Animals Attacked.
31st March, 1906,	2	2	2	7	1	1

## NUMBER of Cases of RABIES in DOGS in IRELAND during the undermentioned period.

	Qt	arter	end <b>e</b> d	-			Number of Cases.
31st March, 1906,			•	•	•	•	e district

NUMBER of OUTBREAKS reported as having taken place, and NUMBER of ANIMALS returned as having been attacked by SHEEP-SCAB and PARASITIC-MANGE in Ireland in the undermentioned period.

	SHEE	P-SCAB.	Parasiti	C-MANGE.
Quarter ended	Outbreaks Reported.	Sheep Attacked.	Outbreaks Reported.	Animals Attacked.
Sist March, 1906,	115	1,942	27	44

Veterinary Branch,
Department of Agriculture and Technical Instruction for Ireland,
Dublin.

## BUTTER PRICE

## ABSTRACTED FROM "THE GROCER," "GROCER'S REVIEW,"

Excepting 1 lb. Rolls all quotations are the Landed Prices of the Choicest Qualities freight, commission,

***************************************	:			WEEK I	ENDING-	043-4445-51011
COUNTRY OF	Type of Package.	Place of Sale.		AP	RIL.	
ORIGIN.	Type of I ackage.	1 Ince of Salo.	7th.	14th.	21st.	28th.
	1		Per cwt.	Per cwt.	Per cwt.	per ewt.
IRELAND—			8. 8.	8. 8.	3. 8.	8. 8.
Creamery Butter.	Kiels, kegs, or	London,	102	102	100-104	99-102
	pyramid boxes,	Liverpool,	96-101	96 - 100	96-100	96-101
		Bristol,	_	-	_	
		Cardiff,	108-110	100-105	102104	102 -104
		Manchester,	101	100-104	98-104	100-102
		Birmingham,	-	-		-
		Glasgow,	_		_	_
	}	Limerick,	98-100	96-100	94-100	93-99
		Cork,	_	-	_	92 98
		Belfast	-	-	-	-
		Dublin,	93-103	102	100 -102	98-103
	1 lb. rolls, 54 lb.	F. O. R.,	109	109	106	104
Factories	boxes.	London,	86-92	_	83-86	83-88
Factories,	_	<b>*</b>	88-94	88-94	88-94	86-94
		n	00-92		90	
		35	-			
		03:0	_	_		96
Farmers' Butter,	Firkins, 1st.,	0-1		90-96	86-90	84 -86
Tarmors Duner,		0-1	93-97	80-80 83	7782	73-78
		Cork,	84-87		70-72	70-73
		Cork,	64-75	70-74	70-12 72-87	73-87
	Fresh,	Cork,	75-90	77-93		
France, I	12×2 lb. rolls,	London,	Per doz. lbs. 11/6 to 14/-	Per doz. lbs. 11/6 to 14/-	Per doz. lbs. 11/6 to 14/-	Per doz lhs. 11/6 to 14/-
	Paris baskets,	do.,	Per cwt. 110-114	Per owt. 106-114	Per cwt. 110-114	Por cwt. 106-114
DENMARK AND SWEDEN.	Copenhagan	Quotation,	95 Kr. 106/8 per per 50 cwt. Kilo.	96 Kr. 106/8 per = per 50 cwt. Kilo.	95 Kr 106/8 per = per 50 cwt. Kilo.	93 Kr. 104/5 per = per 50 cwt. Kilo.
		Average overprice,	-	_	-	
	Kiels,	London,	109-112	108-112	108-112	107-110
		Liver <b>p</b> ool,	112-115	108-114	108-114	108-114
	1	Delete1				_
	1	Bristol,		l		
		Cardiff,	116-120	114	113-114	113
		a	116-120 108-114	114 108-111	109-112	109-111
		Cardiff,			109-112 108-112	109-111 106-112
		Cardiff, Manchester, Birmingham, Newcastle-on-	108-114	108-111	109-112	109-111
		Cardiff,  Manchester,  Birmingham,  Newcastle-on- Tyne.	108-114 110-116	108-111	109-112 108-112	109-111 106-112
		Cardiff,  Manchester,  Birmingham,  Newcastle-on- Tyne. Glasgow,	108-114 110-116 110-112 108-112	108-111 108-113 —	109-112 108-112 108-111	109-111 106-112 108-110
		Cardiff, Manchester, Birmingham, Newcastle-on- Tyne. Glasgow Leith,	108-114 110-116 110-112	108-111 108-113 — 106-109	109-112 108-112 108-111	109-111 106-112 108-110 106-109
	1 lb, rolls, 10×24	Cardiff, Manchester, Birmingham, Newcastle-ou- Tyne. Glasgow Leith,	108-114 110-116 110-112 108-112 114-115	108-111 108-113  106-109 106-111	109-112 108-112 108-111 106-109	109-111 106-112 108-110 106-109 104-110
Finland,	lbs. boxes.	Cardiff, Manchester, Birmingham, Newcastle-on- Tyne. Glasgow Letth, F. O. R. London,	108-114 110-116 110-112 108-112 114-115 112-113 114/4	108-111 108-113  106-109 106-111 112 114/4	109-112 108-112 108-111 108-109  112-118	109-111 106-112 108-110 106-109 104-110 109-113
FINLAND,	1 lb. rolls, 10×24 lbs. boxes. Kiels,	Cardiff, Manchester, Birmingham, Newcastle-on- Tyne. Glasgow Letth, Hull, F. O. R. London, Manchester,	108-114 110-116 110-112 108-112 114-115 112-113	108-111 108-113  106-109 106-111 112 114/4	109-112 108-112 108-111 108-109  112-118 144/4	109-111 106-112 108-110 106-109 104-110 109-113 112/-
FINLAND,	lbs. boxes.	Cardiff, Manchester, Birmingham, Newcastle-on- Tyne. Glasgow Letth, F. O. R. London,	108-114 110-116 110-112 108-112 114-115 112-113 114/4	108-111 108-113  106-109 106-111 112 114/4	109-112 108-112 108-111 108-109 	109-111 106-112 108-110 106-109 104-110 109-113 112/-

## STATISTICS.

"GROCER'S GAZETTE," AND OTHER TRADE REPORTS.

The Nett F.O.R. Price to an Irish Creamery would be 5s. to 7s. per cwt. less. This figure covers handling, &c.

				7	WEEK END	ING—			
			MAY. ,				JUNE.		
	5th.	12th.	19th.	26th.	2nd.	9th.	16th.	23rd.	30th.
	Per cwt.	Per cwt.	Per cwt.	Per cwt.	Per cwt.	Per cwt.	Per cwt.	Per cwt.	Per cwt.
	8. 8.	8. 8.	8. 8.	8. 8.	#. 8.	R. R.	8, 8.	R. 8.	8. 8.
	98-102	98-102	100-104	100-104	102-104	102-106	102-106	102-106	102-106
	97-101	97-101	104-106	104-106	102-105	102-106	101-104	101-104	101-105
	_	101-102	104-106	104-106	103-105	103-105	105107	105-107	106-108
	100-104	102-104	103-105	-	105-106	103-106	103-106	102-107	105-107
	100-104	98-102	100-104	102-104	102-105	102-103	102-105	102-104	102-104
	_	-	100-104	102-104	102105	102-104	103-105	101-105	98-103
		_	_	_	-	102-103	100-103	98-103	102-108
	94-98	90-97	94-98	96-101	96-100	95-100	96-100	96-100	95101
	95-99	93-96	94-101	96-99	94-100	96-99	96-100	96-100	94-98
	98-103	98-103	98-103	98-103	98-103	98-103	98-107/4	102/8-107/4	102/8-107/4
	101	101	101	103	103	105	106	106	109
	82-92	84-96	90-98	90-98	90-99	88-100	90-100	92-100	92-100
	86-91	86-90	92-98	92-98	92-98	88-98	92-98	92-98	94-100
	_	_	_	_	_	_	_	_	_
		84-90	86-92		_	_	_	_	_
	96	96-98	91-94	_		96-98	95-98	94-98	96-97
	83	83	83-85	83-85	84-85	84-85	85-86	87	87
	75-77	- 76-80	79-84	80-84	81-83	81-84	84-85	83-86	84-86
	70-76	70-74	71-75	75-81	80-82	80	84	82-84	79-83
	77-92	79-90	82-91	81-92	85-92	85-90	86-91	87-92	84-91
•	Per doz. lbs.			Per doz. lbs.			Per doz. lbs.	Per doz. lbs.	Per doz. lbs.
	11/- tc 13/6	11/- to 13/-	10/6 to 12/6	10/6 to 12/6 Per cwt.	10/6 to 12/6	10/6 to 12/6 Per cwt.	10/6 to 12/6 Per cwt.	10/6 to 12/6 Per cwt.	10/6 to 12/6 Per swt.
_	Per owt. 106-110	Per owt. 106-108	Per cwt. 94-106	94-106	Per owt. 102-108	100-104	100-104	92-106	100-104
	90 Kr. 101/1 per - per	90 Kr. 101/1 per = per	90 Kr. 101/1 per = per	96 Kr. 107/10 per == per	_	94 Kr. 105/7 per == per	95 Kr. 106/8 per per	96 Kr. 107/10 per = per	96 Kr. 107/10 per = per
	50 cwt. Kilo.	Kilo.	Kilo.	Kilo.		Kilo.	Kilo.	60 cwt. Kilo.	50 cwt. Kilo,
	104-107	104 107	100 110	109 110	100 110	108-110	111-113	111-114	108-112
	106-111	104-107	108-110	108-110 110-112	108-110	110-114	112-113	112-116	110-116
	100-111	105-108	110-112	110-112	109-112	110-118	112 110		
	111-112	107-109	100 110		112-114	112-114	114-115	113	114-116
	104-108	107-108	108-110	100 110		108-112	110-112	110-114	108-112
	104-110	102-105	105-109	108-112 107-109	110-113 107-111	105-112	110-112	109-113	108-118
	108-110	103-105	105-109 105-107	107-109	107-111	108-110	109-111	109-111	109-112
	104-107					108-112	110-114	110-114	110-114
	102-107	104-105	103-106	107 102	110-112		102-113/6	112/6-113/8	112-113
	106-109	104-105	105-106	107-108	110-111	110-111	113-115	112/0-110/0	*** ***
	108/8	108/6	105-109 108/6	108-110 11 <b>2</b> /-	108-110 112/-	110-114 114/4	115-115	116/8	116/8
	100-104	96-102	100-106	109-107	104-107	103-107	104-107	100-107	100-106
	108-105	100-102	105-107	105-107		106-108	106-108	106-108	106-108
		100-100		1					
	102-106		104-107	105-108	106-109	108-110	111-114	112-115	

[Continued on pages 776,777.

## BUTTER PRICE

ABSTRACTED FROM "THE GROCER," "GROCER'S REVIEW,"

Excepting 1 lb. Rolls all quotations are the Landed Prices of the Choicest Qualities, freight, commission,

ř			1		WEEK E	NDING	
COUNTRY OF				***********	A	PRIL,	
ORIGIN.	Type of Package.	Place of Sale.	7th	.	14th.	21st.	28th.
			Per c	wt.	Per cwi.	rer cwt.	Per cwt.
Russia & Siberia.	Kiels,	London, Liverpool,		102 100	8, «, 80-102 96-97	%. %. 86–100 95–97	88-100 92-96
-		Bristol, Cardiff,		98	_	94-96	96
		Manchester, Birmingham,	.	.00	95-100 94-98	95-98 94 <b>-</b> 98	94-98
		N'castle-on-Tvne	,				
•	,	Glasgow, Leith, Hull,	104-	105	98-100	96-98	94-98
HOLLAND,	Boxes,	London,			100-106	100-104	100-102
	Rolls,	do	Per do	z. lbs.   -12/6	Per doz 1bs. 11/6-12	Per doz, lbs. 11/6-12/6	_
•	Boxes,	Glasgow, Fresl	a. 108- 105-	110 106	106-108 103-104	108-109 104-105	108-109 104-105
		Manchester	. 102-	-104	100-102	102	104-106
		Hull,		- ]	-		-
Italy,	Rolls,	London, .	Per do 12/- to		Per doz. lbs. 12/- to 13/-	Per doz. lbs. 12/- to 13/-	Per doz. lbs 12/- to 13/-
CANADA,	56 lb. boxes	London	<u></u>	- 1	_		_
•		Liverpool, .	-	- !		_	
		Bristol, .	-	- ¦		-	-
		Cardiff, .		-	-	_	<u> </u>
		Birmingham, .	-	-			_
			-	•	_	_	
		Leith, .	••	-		-	
AUSTRALIA & NEW ZEALAND.*	56 lb. boxes,	London,	NZ. 9 A. \ 8. 1 u.	12-100 12-100 102-108	N.Z. 98-10. A. ( s. 92-98 u. 100-10	N.Z. s. 98-102 ,. u. 106-108 8 A. ( s. 93-98	N.Z. 78-102 A. { s. 94-98 U. 108-11
BURUKNU.		Liverpool	N.Z. 1	VV-1V2	N.Z. 100-102	N.Z. 100-109	N.Z. 102-104
		Bristol,	N.Z. 1 A. 92-	96 U2-101	A. 90-95 N.Z. 101-103	A. 90-98 N.Z. 101-103 A. 91-97	A. 90-96 N.Z. 102-108 A. 98-98
	- San Carlotte	Cardiff,	2. 00	-	A. 91-97 N.Z. 100-102	N.Z. 102-104	A. 92-98 N.Z. 104-105
		Manchester,	N.Z. 9	-98	A. 94-96 N.Z. 99-102 A. 92-96	A. 90-98 N.Z. 100-103 A. 94-98	A. 94-102 N.Z. 103-104 A. 98-100
		Birmingham,	A. 90	)-96 	N.Z. 100-104 A. 100-96	N.Z. 102-104 A. 90-98	N.Z. 104-106 A. 93-100
		N'castle-on-Tyr Glasgow,	ne, N.Z. 1 A. 90	 102-104 -100	N.Z. 101-102	N.Z. 96-102	N.Z. 96-102 A. 90-98
			N.Z. 1	lv7-108 8-1 <b>0</b> 8	A. 88-96 N.Z. 104-106 A. 98-102	A. 90-96 N.Z. 102-104 A. 98-102	N.Z. 109-104 A. 100-103 96-100
ARGENTINA	10 IL 1	Hull,		-100	98-100 s. 93-90	98-100	Ha
	66 lb. boxes,	1	8. 86 10.8. 10	04-108	и.н. 104-106	s. 50-90 u.s. 104-108 96-100 95-99	u.s. 106-108 98-102
		Bristol,		9-97 8-100	96-98 95-99 102	95-99	98-99
		Manchester. Birmingham,	100	3-102 0-102	99-102 100-102	98-100 98-102	98-101 99-102
TIMETER COLUMN	Tubs and boxes.			103 U-86	<del>!</del>	74-84	16-06
UNITED STATES,		T		6-96	86-94	86-96	84-94
		Bristol,		6-96	85-87	85-87	84-67
		Cardiff,		_	-	_	-
• '	1	Manchester,	.		1 _		

## STATISTICS—continued.

"GROCER'S GAZETTE," AND OTHER TRADE REPORTS.

The Nett F.O.R. Price to an Irish Creamery would be 5s. to 7s. per cwt. less. This figure covers handling, &c.

110	ndling,			w	EEK ENDIN	IG			
-T-		***********	MAY.				JUNE.		
-		1	1	1			1	· · · res the Victorian subseque	1
	5th.	12th.	19th.	26th.	2nd.	9th.	18th.	23rd.	30th.
	Per cwt.	Per cwt.	Per cwt.	Per cwt.	Per ewt.	Per cwt.	Per cwt.	Per cwt.	Per cwt.
	88- <b>9</b> 8 92-96	8. s. 80-98 92-96	84-96 92-96	84-96 94-98	86-98 94-98	86-98 94-98	94-98 95-98	86-98 94-98	94-98 95-98
	96-98	_	92-94	_	98-100	98-100	98-100	98	94-98
	94-98	94-98	100-102 94-98	94-98	93-98	92-98	92-99	92-98	92-96
	91-100	91-98	94-98	97-100	94-98	96-100 94-100	94-99	92-98 95-100	98-100 94 <del>-9</del> 6
1	100-102	98-102	98-102	98-102	100-106	100-102	100-104	102-106	104
!	-		-	-	_	-	-	_	-
-	105 <b>-10</b> 8 101- <b>103</b>	104-106 101-102	102-104 98-100	=	108-109 102-104	107-108 101-103	110-111 104-106	112-113 106-108	112-113 106-108
		98-100	100-102	102-104	102-105	102-104	102-106	102-103	100-104
		_				_	<u> </u>		-
	er doz. lbs. 2/6 to 13/-	Per doz, lbs. 12/6 to 13/-	Per doz, lbs. 11/6 to 12/6	11/6 to 12/6	Per doz. lbs. 11/6 to 12/6	11/6 to 12/6	11/6 to 12/6	11/6 to 12/6	Per doz. lbs. 11/6 to 12/6
		-		Per ewt.	Per cwt.	Per cwt. 100-104	Per cwt. 100-104	Per cwt. 100-104	Per ewt. 102-104
	_	-	-	98-100	98 100	96-100	98-102	98-102	98-102
			_	_	100-102	100-102	100-102	100-102	103-107
	-	_	-	_	103-105	103	102-104	102-105	-
İ	-		_	-	_		-	-	
	_	_	_	_	_	_	_	_	_
. I . N.)	Z = 78-102						1		N.Z s. 100-106
Α,,	u. 100-102 s. 94-98	N.Z. 78-102 A. ( 8. 76-98 u 102-110	N.Z. 100-102 4 1 8. 91-98	N.Z. 100-103 4 \ 8. 94-100	N.Z. 100-104 A ( 8. 96-100	N.Z. 78-104 A ) S. 96-100	N.Z. 102-104 A 18. 98-102	N.Z. 96-106 A. { s. 98-102 u 104-106	u. 102-104
	u. 106-110	u 102-110							A. { s. 98-102 u. 100-104
1.7	2. 102-101 92-96	N.Z. 104-105 A. 94-98	N.Z. 102-104 A. 94-98	N.Z. 100-105 A. 94-98	N.Z. 102-105	-	N.Z. 100-101	N.Z. 100-104	N.Z. 101-108
N.	Z. 102-103 92-98	A. 94-98 N.Z. 103-104 A. 94-99	N.Z. 104 A. 96-98	N.Z. 104 A. 96-98	N.Z. 104 A. 96-98	N.Z. 104 A. 96-98	N.Z. 105-107 A. 98-100	N.Z. 106-108 A. 98-100	_
N.	Z. 104-105	N.Z 96-98	N.Z. 97-104	-	N.Z. 105-106	N.Z. 104-106	N.Z. 104 - 105	N.Z. 104 106	98-102
N.	94-102 Z. 102-103	A. 100-103 N.Z. 100-102	A. 94-100 N.Z. 100-102	N.Z. 102-104	A. 98-100	A. 98-100	A. 98-100	A. 98-100	=
A.	96-100 Z. 103-106	A. 90-98	-		-	A. 98	-	-	·
A.	92-100	A 94-99	A. 96-98	N.Z 96-99	91 100	94-98	A. 98-100	A. 96-100	A. 96-98
N.	Z. 96-104	N.Z. 104	A. 96-100	N.Z. 104-105		N.Z. 102-104	A. 96-102	A. 96-102	A · 104-106
IN.	94-98 Z. 10 <b>2-104</b>	A. 94-100 N Z. 102-104	N.Z. 102-104	A. 96-100 N.Z. 104-105	A. 100-102 v.Z. 104-105	A, 100-102 N.Z. 104-105		N.Z. 102-104	N.Z. 104-106
A.	100-102 96-99	A. 100-102 96-99	A, 100-102 93-98	A. 102~104 90-95	A. 112-114	A. 102-104	A. 101-102	A 101-102	A. 102-105
1	н. 91-98	8. 94-98	в. 96-98	u. 106-106	94-98		100-102	100-102	
1	u. 102–108 97 <b>-10</b> 0	u. 106-108 96-100	u. 106-108 96-100	96-100	98-100	96-98	_	_	100-106
	96-99 102	96.99	100	_	=		_	_	=
	97-98 98-102	97 97-100	96-97 98-102	100-102			_	_	_
_		-	_	_	_				_
	70-80	70 86	70-8d	74-90		78-90	78-90	88-92	74-92
1	81-94 84-87	78-93	84-98 84-87	84-94	84-94	88-92	84-90	84~90	90-94
		_	Of		_	_	_		~
					_			_	-

## TABLES SHOWING THE EXPORTS

TABLE

RETURN of the Number of Animals Exported from Ireland to Great

Ports of Embarkation

			CATTLE	<b>.</b>			SHEEP.		1	SWINE	L.
IRISH PORTS.	Fat.	Stores.	Other Cattle.	Calves.	Total.	Sheep.	Lambs.	Total.	Fat.	Stores	Total.
Ballina,	148	92	•		240	20		20	134		134
Belfast,	3,226	<b>17,39</b> 5		234	20,855	644	2	646	3,778	152	3,930
Coleraine,	5	149	•		154				13		13
Cork,	1,398	7,327	420	4,480	13,625	5,472	•	5,472	9,265	.	9,265
Drogheda, .	3,894	357	•		4,251	1,334	6	1,840	2,067	237	2,304
Dublin,	27,237	27,955	743	1,055	,56,990	24,943	28	24,971	75,151		75,151
Dundalk,	3,699	2,027			5,726	26	11	37	4,766	209	4,975
Greenore, .	286	1,722	•	10	2,018	84		84	541	162	703
Larne,	808	3,250			4,058	9		9	18	348	366
Limerick,	478	1		•	479			•			
Londonderry, .	4.190	6,089	255	2,237	12,771	778		778	970		970
Newry,	100	873		•	473	530		<b>59</b> 0	417		417
Portrush,	47	60			107	1		1	492		492
Sligo,		338		•	. 838	239		239	8,978		6,978
Warrenpoint	8	•		•	8				1	,	1
Waterford, .	4,517	6,168	267	589	11,536	2,841	.	2,841	12,479	•	12,479
Westport,	54	2	38		94	615	.	615	2,159	•	2,152
Wexford, .	1,208	72		•	1,290	460	•	460	2,270	•	2,270
Total,	51,303	78,872	1,728	8,605	135,008	88,061	47	38,098	121,492	1,108	122,500

## AND IMPORTS OF ANIMALS.

I.

BRITAIN during the Three Months ended 31st MARCH, 1906, showing the in Ireland.

		Ho	rses.	· · · · · · · · · · · · · · · · · · ·	Mules		Total		
Goats.	Stallions.	Mares.	Geldi <b>ngs.</b>	Total.	or Jennets.	Asses.	Animals.	IRISH PORTS.	
		2		2			396	Ballina.	
5	3	660	1,348	2,011		4	27,451	Belfast.	
		1	.	1			168	Coleraine.	
		100	179	279		200	28,841	Cork.	
5		12	16	28	•		7,928	Drogheda.	
48	31	1,103	905	2,099		6	159,264	Dublin.	
12		<b>3</b> 5	46	81			10,831	Dundalk.	
163		717	442	1,159		1	4,128	Greenore.	
1	3	36	. 38	77			4,511	Larne.	
		•		•			479	Limerick.	
1	1	24	65	90		3	14,608	Londonderry.	
3	•	1		1			1,484	Newry.	
		2		2			602	Portrush.	
•		2		2			7,557	Sligo.	
•	٠	•	.				9	Warrenpoint.	
1	1	370	508	874		2	27,733	Waterford	
•		1	2	3			2,864	Westport.	
		4	7	11		•	4,021	Wexford.	
239	39	3,070	8,611	6,720		215	302,875	Total.	

TABLE
RETURN of the Number of Animals Exported from Ireland to Great
Ports of Debarkation

			CATTLE	•			SHEEP.		1		
British Ports.	Fat.	Stores.	Other Cattle.	Calves.	Total.	Sheep.	Lamba.	Total.	Fat.	Stores.	Total.
Ardrossan, .	402	4,433	•	71	4,906	58	•	56	266	102	368
Ayr,	482	4,686	•	63	5,221	21	2	23	186	123	309
Barrow,	561	2,478	•		3,039				2,128	•	2,128
Bristol,	1,057	2,038	•	580	3,675	2,514		2,514	10,445	•	10,445
Dover,											•
Falmouth,	•				•						•
Fleetwood .	3,017	1,795		42	4,854	510		510	227	67	294
Glasgow,	3,873	11,107	1,043	3,230	19,253	63		63	8,852		8,852
Greenock,	41	992		1	1,034	2		2	16		16
Heysham,	986	6,370	21		7,827				12,368		12,368
Holyhead, .	7,011	9,896	44	56	17,036	7,144	6	7,150	48,492	162	48,654
Liverpool,	22,965	18,040	377	1,680	43,062	21,022	38	21,060	28,919	407	29,826
London,	•			•				•			
Manchester, .	4,928	887	12		5,827	2,495	1	2,496	988		988
Milford, .	2,971	6,011	23	2,781	11,788	4,224		4,224	7,853		7,853
Newhaven, .	•	24	.		24			•			•
Plymouth, .	519	129		22	670						•
Portsmouth, .			•								
Silloth,	1,622	1,341	203		3,168						•
Southampton, .	101	68		89	258				752		752
Stranzaer,	787	3,078			3,865					247	247
Whitehaven, .						.					
Total,	51,303	73.372	1,723	8,605	135,003	38,051	47	38,098	121,492	1,108	122,600

II.

BRITAIN during the Three Months ended 31st MARCH, 1906, showing the in Great Britain.

		Hol	rses.		Mules or Jennets.	Asses,	Total Animals.	BRITISH PORTS.	
Conts.	Stallions.	Магев.	Geldings.	Total.					
	•	169	278	387		1	5,718	Ardrossan.	
		21	39	60		1	5,614	Ayr.	
1		39	94	133		•	5, <b>3</b> 01	Barrow.	
		67	153	220		•	16,854	Bristol.	
		•		•		•	•	Dover.	
	,	1	1	2			2	Falmouth.	
1		252	414	700			6,359	Fleetwood.	
1		149	273	422		7	28,598	Glasgow.	
1		3	3	6	.		1,059	Greenock.	
		146	253	399			20,094	Heysham.	
170	31	1,617	1,245	2,893		1	75,904	Holyhead.	
61		177	222	399		181	94,089	Liverpool.	
1		1		1			2	London.	
1		58	37	90			9,402	Manchester.	
1	1	379	502	882	•	23	24,769	Milford.	
		19	9	21		1	46	Newhaven.	
		•	4	4			674	Plymouth.	
	.			•				Portsmouth.	
		3	4	7			3,173	Silloth.	
•	•	5	13	18			1,028	Southampton.	
1	3	36	37	76			4,189	Strangaer.	
		•	•	•			•	Whitehaven.	
236	39	3,070	3,611	6,720		215	302,875	Total.	

TABLE
RETURN of the Number of Animals Imported into Ireland from Great Britain
of Debarkation

IRISH PORTS.			CATTLE	•		Sheep. Swine.					
		Stores.	Other Cattle.	Calves.	Total.	Sheep.	Lambs.	Total.	Fat.	Stores.	Total.
Ballina,			•						•		. [
Belfast,		50		1	51	8,324		3,324	•	2	2
Coleraine, .	•				•						
Cork,		12			12	316		16			
Drogheda, .		1			1						
Dublin,	•	54		2	56	1,038	35	1,078		2	2
Dundalk, .	•		•	•	·			•	•	•	
Dundrum, .	•		•	•	•			•	•		•
Greenore, .	•	3			3			•			
Larne,		14			14	65	•	65		.	
Limerick, .	•				•			•			
Londonderry, .	•	2			2		•	•		٠,	
Newry,	•				•						.
Portrush,					•			•			
Sligo,		2			2			•	,	•	
Waterford, .		3			3	1		1			
Westport, .			.								.
Wexford											
										-	
Total	•	141		3	144	4,744	86	4,779		. 4	4

III.
during the Three Months ended 31st MARCH, 1906, showing the Ports in Ireland.

		Ho	rses.		Mules		Total		
Goats.	Stallions.	Mares.	Geldings.	Total.	or Jen <b>nets</b> .	A5808.	Animals.	IRISH PORTS.	
•			•	•		•		Ballina.	
	1	40	140	181	2		3,560	Belfast.	
•		•		•		•	· .	Coleraine.	
•	3	12	14	29		•	357	Cork.	
•		2	1	3	,	•	4	Drogheda.	
•	12	253	209	474			1,605	Dublin.	
•		•	8	8	•		8	Dundalk.	
•		•		•		•		Dundrum.	
•		7	1	8			11	Greenore.	
•	4	3	6	13			92	Larne.	
		• .		•				Limerick,	
	3	7	10	20		•	22	Londonderry	
	1	4	3	8			8	Newry.	
		•				. •		Portrush.	
		1		1			8	Sligo.	
	1	43	50	94			98	Waterford.	
				•				Westport.	
		3	5	8			. 8	Wexford.	
	26	375	447	847	2		5,776	Total.	

TABLE
RETURN of the Number of Animals Imported into Ireland from Great Britain
Embarkation in

_			CATTLE	i <b>.</b>			Sheep.			SWINE	•
BRITISH PORTS.	Fat.	Stores.	Other Cattle.	Calves.	Total.	Sh <b>e</b> ep.	Lamba.	Total.	Fat.	Stores.	Total.
Ardrossan, .	•	38	•	1	39	2,648		2,648		,	
Ayr,	•		•			600		600			
Barrow,	• ,			•	•						
Bristol, .		1			1						•
Falmouth, .					•						
Fleetwood, .											
Glasgow,		33	•	1	34	1,472	5	1,477		2	2
Greenock, .	•				•	2		2			
Heysham, .	•	6			- 6						•
Holyhead, .		12		1	13	20	30	60		2	2
Liverpool .		19			19	1		1			•
London,		.		·							
Manchester, .							•				•
Milford,						1		1		.	
Newhaven, .				•							
Plymouth, .		•									•
Silloth,	•	17			17			.			
Southampton,.		1			. 1					.	•
stranraer, .		14			14				•		
Whitehaven, .			.							•	•
Total,		141	-	8	144	4,744	35	4,779			

IV.

during the Three Months ended 31st MARCH, 1906, showing the PORTS of Great Britain.

			Hon	ses.		Mules		Total	
	Goats.	Stallions.	Mares.	Geldings.	Total.	or Jennets.	Asses.	Animals.	BRITISH PORTS.
	•	1	8	18	27	2		2,716	Ardrossau.
	•	1	1	7	9		•	609	Ayr.
	•		•	1	1		•	1	Barrow.
I		•	8	14	22		•	23	Bristol.
	•	•	•	•	•	•	•		Fulmouth,
١	•	2	16	54	72		•	72	Fleetwood.
	•	1	22	43	66	•		1,579	Glasgow.
	•	•	2	4	6		•	8	Greenock.
	•	•	13	20	83			39	Heysham.
	•	12	225	176	413			478	Holyhead.
1	•		23	53	76			98	Liverpool.
I	•	٠	•	•	•		٠	·	London.
I	•		4	•	4		•	4	Manchester.
	•	4	44	49	97			98	Milford.
	• .		2		2		٠	2	Newhaven.
	•		2	•	2			2	Plymouth.
	•		2	2	4		•	21	Silloth.
	•		•		•			1	Southampton.
	•	4	. 3	6	13		•	27	Stranraer.
			•		•		•		Whitehaven.
	•	25	875	447	847	. 2	•	5,776	Total.

### RETURN of the Number of Animals Exported from Ireland to the showing the Ports of

			CATTLI	č. •			Sheep	•	
IRISH PORTS.	Fat.	Stores.	Other Cattle	Calves	Total.	Sheep.	Lambs.	Total.	
BELFAST,		18		1	14		٠		
DUBLIN,	.	16			16				
TOTAL, .	•	29		1	30	•	•	•	

### RETURN of NUMBER of ANIMALS EXPORTED from IRELAND to the showing the Ports of Debarkation

			Cattli	<b>č.</b>			Sheep.	•
ISLE OF MAN PORT.	Fat.	Stores.	Other Ca <b>ttle</b> ,	Calves	Total.	Sh <b>ee</b> p.	Lambs	Total.
DOUGLAS,		29	•	1	30	•	•	

# RETURN of the Number of Animals Imported into Ireland from the showing the Ports of

					OATTLE	G.			SHEEP	•
IRISH PORTS.			Fat.	Stores.	Other Cattle.	Calves	Total.	Sheep.	Lambs.	Total.
BELFAST, .	•									•
Dublin,					•				•	
TOTAL,	•	٠	•	•	•	•	•	•	•	•

### RETURN of the Number of Animals Imported into Ireland from the showing the Ports of Embarkation

		(	CATTLE	I.			SHEEP	•	
ISLE OF MAN PORT.	Fat.	Stores.	Other Cattle.	Calves	Total.	Sh <b>e</b> ep.	Lambs.	Total.	
DOUGLAS, , .	•	•	•	•	•		•		

IBLE OF MAN during the Three Months ended 31st MARCH, 1906. EMBARKATION in IRELAND.

1	SWINE.				Hor	SES.					
Fat.	Stores.	Total.	Goats.	Stal- lions.	Ma <b>re</b> s.	Geld- ings.	Total.	Mules or Jennets	Asses.	Total Ani- mals.	Iris <b>u P</b> ort <b>s.</b>
•										14	BELFAST.
•										16	DUBLIN.
•	•	,	•	•		·	•	·	•	30	TOTAL.

ISLE OF MAN during the Three Months ended 31st MARCH, 1906, in the ISLE OF MAN.

	SWINE.				Hor	ses.					
Fat.	S <b>to</b> res.	Total.	Goats.	Stal- li <b>ons</b> ,	Mares.	Geld- ings.	Total.	Mules or Jennete	A 8866.	Total Ani- mals.	ISLE OF MAN PORT.
•	•	•		•		•	•	•	•	30	DOUGLAS.

ISLE OF MAN during the Three Months ended 31st MARCH, 1906, DEBARKATION in IRELAND.

	SWINE				Hor	ses.					
Fat.	Stores.	Total.	Gonts.	Stal- lions.	Mares.	Geld- ings.	Total.	Mules or Jennets	Asses	Total Ani- mals.	IRISH PORTS.
					1	2	3	<u> </u>		3	BELFAST.
		•									DUBLIN.
•	•	٠		•	1	2	3	•	•	3	TOTAL.

ISLE OF MAN during the Three Months ended 31st MARCH, 1906, in the ISLE of MAN.

	SWINE	•			Нов	SES.					
Fat.	Stores.	Total.	Goats.	Stal- lions.	Mares.	Geld- ings.	Total.	Mules or Jennets	A58 <b>0</b> 8	Total Ani- mals.	ISLE OF MAN PORT
		•	•		1	2	3		•	8	DOUGLAS.

COASTING AND

RETURN of the Number of Animals Shipped to and from Places in Ireland of Embarkation

Inish Ports.			CATTL	E.			Shkep.			SWINE	
IRISH FORIS.	Fat.	Stores.	Other Cattle.	Calves.	Total.	Sheep.	Lambs.	Total.	Fat.	Stores.	Total.
Cork to Aghada Pier,				7	7						
., to Belfast				١.					١.		
" to Spike Island				١.					١.	7	7
., to Queenstown, .						4		4	١.		
"to Waterford,				1	1						,
Total, , .	•	•		8	8	4	•	4	•	7	7
Aghada Pier to Cork, .	-			1	1	198		128	374	1	375
Dublin " .	•						•				
Spike Island " .	•										
Queenstown ,,	•								38		38
Waterford , .	5	5			10	152		152			
Total,	5	5	•	1	11	280		280	412	1	413
Waterford to Ballyhack, .		20			20						
" to Belfast, .	•						•		١.		
" te Duncannon,		140		90	230				١.	10	10
Total,		160		.≠ <b>9</b> 0	250			•	<del>-</del>	10	10
Ballyhack to Waterford, .	275	78			853	154	•	154	375		375
Belfast to Waterford, .		•									•
Duncannon to Waterford,	328	85	•	2	415	90		90	1,004	•	1,004
Kilrush to Limerick	4	101		1	106	17	•	17	967	•	967
Kildysart "	•	•			٠	٠.		•	١.		
Kilkee "	٠	•			•	•			٠.	•	
Portumna	•	•			•			•	550	٠.	550
Seariff	•	•			•		•	•	٠.		٠
Banagher	<u>·</u>	<u> </u>	•				•		<u> </u>	•	
Total	4	101		1	106	17		17	1,517		1,517
Greencastle to Greenore,		55			56				36		56
Greenore to Greencastle,	4	<u>.</u>			4	<u>.</u>		<u>.</u>	Ŀ		<u>.</u>
Londonderry to Moville, .	•	6			. 6		•			i • •	
Moville to Londonderry, .	36	113	5	•	154	1	•	1	9		9
Ballina to Sligo,											
Beimuliet ,		2					•		786	:	786
Total,	-	2	:-	-:-	- 2	<u> </u>	<u>:</u> -	<u>:</u>	786		786
Sligo to Belmullet, .	•				•		•		-	•	
Total,	652	605	- 5	102	1.364	<b>54</b> 6	<u> </u>	546	4,189	18	4,157
				448	1,004	<b>08</b> 0	•	UTV	7,100	10	

#### INLAND NAVIGATION.

during the Three Months ended 31st March, 1906, showing the Places and Debarkation.

		Ног	rs <b>e</b> s.		Mules or		Total	
Goats.	Stallions.	Mares.	Geldings.	Total.	Jennets.	Asses.	Animals.	IRISH PORTS.
	1 .						7	Cork to Aghada Pier,
		1	2	3			3	" to Belfast.
	١.						7	" to Spike Island.
							4	" to Queenstown.
		1	3	4		1	6	,, to Waterford.
		2	5	7		1	27	Total.
		•					201	Aghada Pier to Cork.
		•				•		Dublin
•		•	•		•	•		Spike Island "
•			•	•		•	38 · 162	Queenstown ,, Waterford ,,
	<u> </u>		<u> </u>					
		•	•	•			704	Total.
		1		1			21	Waterford to Ballyhack.
1	]	•	1	1	i i		1	" to Belfant.
1 :	1 :	. 2	i	3	, 8		251	, to Duncannon.
		3	2	6	8	•	273	Total.
<del></del> -	<u> </u>						882	Ballyhack to Waterford.
<u>-</u> -	<u> </u>		·					
<u> </u>	<u> </u>	· .	·	·	<u> </u>		· ·	Belfast to Waterford.
	· .	2		2	·		1,511	Duncannon to Waterford.
	Γ.		4	4			1,091	Kilrush to Limerick.
١.								Kildysart .,
	1 .	1 :	1 .					Kilkee
١.	١.		1 .		Ι.		550	Portumna
١.		١.	1 .					Scariff .,
١.	1 .	١.	1 .		١.		.	Banagher
	-:-		1	4	:-		1,644	Total.
	<u> </u>			-:-			91	Greencastle to Greenore.
	7		<b> </b>		<b></b>		1	Greenore to Greencastle.
			-			•	6	Londonderry to Moville.
	1		<del></del>		<u> </u>	•	164	Moville to Londonderry.
-	<u> </u>				<b> </b>			Ballina to Sligo.
1:	1				1	:	788	Belmullet "
- <u>:</u> -	╁	<u> </u>	<u> </u>	<del>-</del>	<b>-</b> :-	-:-	788	Total.
-	<del>                                     </del>		- <u>:</u> -	<del></del> -	- <u>:</u> -	<u> </u>		Sligo to Belmullet.
_	<del> </del>							-
١,		7	11	18	8	1	6.094	Total.

RETURN of the Number of Horses Exported from Ireland through Great Britain to the Colonies and Foreign Countries during the Three Months ended 31st March, 1906, showing the Ports of Embarkation in Ireland.

					Number of Horses.					
	Por	TS.			Stallions.	Mares.	Geldings.	Total.		
Belfast,		•		•	-	79	27	106		
Dublin,					-	34	48	82		
Greenore,						309	132	441		
Waterford,		•			-	2	12	14		
Tota	<b>.</b> 1.		•		_	421	219	643		

RETURN of the Number of Horses Imported into Ireland through Great Britain from the Colonies and Foreign Countries during the Three Months ended 31st March, 1906, showing the Ports of Debarkation in Ireland.

					Number of Horses.					
	Por	TS.			Stallions.	Mares.	Goldings.	Total.		
Belfast,			•		_	11	17	38		
Dublin,	•	•	•	•	-	-				
T	otal,	•	•		_	11	17	<b>3</b> 8		

## PASSENGERS TO PLACES OUT OF EUROPE DURING MAY AND THE FIVE MONTHS ENDED 31st MAY, 1906.

RETURN of the Numbers, Nationalities, and \*Destinations of the Passengers that left the United Kingdom for places out of Europe during the Month ended 31st May, 1906, and the Five Months ended 31st May, 1906, compared with the corresponding periods of the previous Year.

			Br <b>i</b> tish	EMPIRI	<b>l.</b>		FORE	GN COUN	TR <b>IES.</b>		Total
NATIONALITY.	British North America.	Austra- lia and New Zealand	British South Africa.	India, includ- ing Ceylon.	Other British Colonies and Pos- sessions.	Total.	United States.	Other Foreign Coun- tries.	Total,	Grand Total.	for corres- ponding Terrod of 1905
					Month en	ded 31st	Мау.				
English,	16,435	1,299	1,094	130	273	19,231	7,627	435	8,062	27,293	16,26
Scotch,	2,892	245	226	21	5	3,389	2,434	26	2,460	5,849	4,44
Irish,	806	82	27	-	7	922	6,740	14	6,754	7.676	5,81
Total of British origin.	20.133	1,626	1,317	151	285	23,542	16,801	475	17,276	40,818	26,52
Foreigners,	3,713	21	300	7	15	4,056	21,568	304	21,872	25,928	18,35
Nationalities not distinguished.		2	-	78	186	266	62	150	212	478	38
Total, .	23,846	1,649	1,647	236	486	27,864	38,431	929	39,360	67,224	45,26
Total for corres- ponding period, 1905.	15,366	826	1,775	144	368	18,479	26,065	720	26,785	45,264	
1				Fi	ve Month	ended 3	lst May.	-	The state of the s		
English,	43,088	4,945	6,490	1,149	1,567	67,239	28,572	2,532	31,104	88,343	70,25
Scotch,	9,899	602	1,212	165	68	11,916	9,420	319	9,739	21,685	15,88
Irish,	2,015	305	278	12	.25	2,635	20,398	102	20,500	23,135	22,85
Total of British origin.	55,002	5,852	7,980	1,326	1,660	71,820	58,390	2,953	61,343	138,163	108,98
Foreigners,	9,080	85	1,496	47	68	10,776	76.449	1,783	78,232	89,008	79,48
Nationalities not distinguished.	14	4	-	611	923	1,552	201	1,313	1,514	3,066	2,88
Total, .	64,096	5,941	9,476	1,984	2,651	84,148	135,040	6,049	141.089	225,237	191,3
Total for corresponding period, 1906.	50,795	3,976	10,503	1,685	2,488	69, <del>44</del> 7	116,485	5,440	121,925	191,372	

<sup>•</sup> The destinations given are, in all cases, based on the ports at which the passengers contracted to land. NOTE.—The above figures, being made up at the earliest possible date after the close of each Month, are subject to correction in the Annual Returns.

### Account showing the QUANTITIES of certain kinds of AGRICULTURAL into Ireland in each Week from

	WEEK ENDED					
ARTICLES.	3rd March.	10th March.	17th March	24th March.	31st March.	
ANIMALS, LIVING— Horses,		•				
FRESH MEAT-						
Beef owts.		•	•	•	•	
Mutton, "	•	•	•	•	•	
SALTED OR PRESERVED MEAT— Bacon, cwts.	_					
Beef,						
Hams,	•	•	•	•	•	
Meat, unenumerated, Salted or	•	• .	•	•	•	
Fresh.  Meat preserved otherwise than by	•	•	•	•	•	
salting,	•	•	•	2,853		
DAIRY PRODUCE AND SUBSTITUTES-						
Butter, ewts.	144	166	195	148	205	
Oheere, ,,		5				
Milk, Condensed, ,	45	45	38	92	21	
, Cream, , Preserved, other kinds ,						
Eggs, gt. hunds.					.	
LARD, cwts.		50	300	2,628		
CORN, GRAIN, MEAL, AND FLOUR-	•					
Wheat,	8.300	137,100 21,500	75,600	71,700 90,500	2,400	
Barley,	0,000		6,900	17,900	-,300	
Oats, ,,	160	8,400 80	20	:	•	
Beans, ,	122,100	97,700	333,900	452,000		
Maize or Indian Corn, . ,, FRUIT, RAW	100,100	51,100	000,000	204,000		
Apples, cwts.						
Ourrants,	•	•	•	•	•	
Pears,						
Plums, , ,		• .	•	•	•	
Grapes,					;	
Oranges,	•	•		••	•	
Strawberries,			:			
HAY, tons					.	
STRAW,	54	38	.	83	.	
MOSS LITTER,	54	22		107	14	
HOPS,	.				.	
VEGETABLES, RAW-						
Onions, bushels	3,688	4,824	1,280	1,780	160	
Unenumerated, £	•	44	•	.	8	
VEGETABLES, DRIED,		28	:	:		
POULTBY AND GAME, £						

This Table is confined to the Imports of certain kinds of Agricultural Produce into to a request from this Department kindly consented to asparate the Irish Imports (direct) form of Weekly Returns. It is hoped that the Department may soon be able to secure With these and such returns as the above, the Department will be in a position manufactured and agricultural products.

PRODUCE Imported direct (i.e. from the Colonies or Foreign Countries) 3rd March, 1906, to 26th May, 1906\*.

			WEER	ENDED			
7th April.	14tb April,	21st April.	28th April.	5th May.	12th May.	19th May.	26th May.
•	•	•		•		•	•
:	:	•	:	:	:	:	:
1 16	•		2,683	:	:	:	:
•	•	•	. 4	:		10	. 19
821	35	284					77
242	254	120	74	197	196	200	20
108	38	101	30	10	39		7
468	332	830		•	501	:	72
85,700	353,000 11,400	200,900 11,800	41,900 21,600 3,100	159,000 8,500 68,600	274,600 500	124,900 29,000	124,90 7,70
	20	1,900	60	2,300		80	2
187,900	215,700	299,700	165,000	56,200		96,500	194,70
	:						:
							:
							:
121 187	62 21	293 4	657 184	. 1	48 12	633 24	27 1
64	•	40	•				•
5		5					•

Ireland from the Colonies and Foreign Countries. The Board of Customs have in answer from those of the United Kingdom and to supply this Department with them in the returns of Imports of all classes into Ireland which are re-shipped from Great Britain, to gauge the economic dependence of this country on other countries for its supplies of

Statistics and Intelligence Branch,

Department of Agriculture

and Technical Instruction for Ireland.

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